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Route to:

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 31, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,428,079 through 4,429,418
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 16, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,358,864	06/260,368	11/16/82
4,358,867	06/235,698	11/16/82
4,358,872	06/222,922	11/16/82
4,358,897	06/239,699	11/16/82
4,358,899	06/249,182	11/16/82
4,358,921	06/297,771	11/16/82
4,358,962	06/257,536	11/16/82
4,358,970	06/234,638	11/16/82
4,358,976	06/228,689	11/16/82
4,358,992	06/284,449	11/16/82
4,359,004	06/295,789	11/16/82
4,359,034	06/243,425	11/16/82
4,359,054	06/276,184	11/16/82
4,359,081	06/318,949	11/16/82
4,359,089	06/220,317	11/16/82
4,359,091	06/295,558	11/16/82
4,359,099	06/216,270	11/16/82
4,359,123	06/247,844	11/16/82
4,359,133	06/295,403	11/16/82
4,359,161	06/314,765	11/16/82
4,359,186	06/287,639	11/16/82
4,359,190	06/293,776	11/16/82
4,359,191	06/237,941	11/16/82
4,359,209	06/337,446	11/16/82
4,359,227	06/249,026	11/16/82
4,359,230	06/292,127	11/16/82
4,359,232	06/224,219	11/16/82
4,359,239	06/216,247	11/16/82
4,359,266	06/223,432	11/16/82
4,359,274	06/253,404	11/16/82
4,359,283	06/258,622	11/16/82
4,359,298	06/222,838	11/16/82
4,359,318	06/332,159	11/16/82
4,359,346	06/254,700	11/16/82
4,359,347	06/254,728	11/16/82
4,359,348	06/274,601	11/16/82
4,359,360	06/329,459	11/16/82
4,359,424	06/281,633	11/16/82
4,359,425	06/249,455	11/16/82
4,359,429	06/297,377	11/16/82
4,359,439	06/271,245	11/16/82
4,359,446	06/237,448	11/16/82
4,359,447	06/222,181	11/16/82
4,359,467	06/256,369	11/16/82
4,359,489	06/244,853	11/16/82
4,359,491	06/221,833	11/16/82
4,359,525	06/323,936	11/16/82
4,359,526	06/298,637	11/16/82
4,359,547	06/292,192	11/16/82
4,359,548	06/376,712	11/16/82
4,359,552	06/291,198	11/16/82
4,359,556	06/271,741	11/16/82
4,359,567	06/307,991	11/16/82
4,359,568	06/265,719	11/16/82
4,359,586	06/233,630	11/16/82
4,359,594	06/232,773	11/16/82
4,359,624	06/240,503	11/16/82
4,359,638	06/232,397	11/16/82
4,359,640	06/238,991	11/16/82
4,359,641	06/269,287	11/16/82
4,359,669	06/219,003	11/16/82
4,359,677	06/239,627	11/16/82
4,359,743	06/260,630	11/16/82
4,359,756	06/278,662	11/16/82
4,359,767	06/238,938	11/16/82
4,359,768	06/251,601	11/16/82
4,359,777	06/227,447	11/16/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,485,982, Re. S.N. 934,586, Filed Nov. 25, 1986, Cl. 242/57.1, WEB TRACKING SYSTEM, Robert P. St. John, et al., Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: W. Douglas Carothers, Jr., Ex. Gp.: 240

4,493,417, Re. S.N. 937,211, Filed Dec. 3, 1986, Cl. 206/387, STORAGE DEVICE FOR FLAT RECORDING MEDIA, Peter Ackeret, Owner of Record: *IDN Inventions and Development of Novelties AG, Chur, Switzerland,* Attorney or Agent: Douglas N. Larson, et al., Ex. Gp.: 240

4,546,969, Re. S.N. 935,233, Filed Nov. 21, 1986, Cl. 296/181, TRAILER FOR AN ARTICULATED VEHICLE, Frederick G. Wilson, Owner of Record: *Inventor,* Attorney or Agent: Thomas B. Van Poole, et al., Ex. Gp.: 310

4,547,833, Re. S.N. 937,578, Filed Dec. 3, 1986, Cl. 361/386, HIGH DENSITY ELECTRONICS PACKAGING SYSTEM FOR HOSTILE ENVIRONMENT, Stanley O. Sharp, Owner of Record: *Schlumberger Technology Corp., New York, N.Y.,* Attorney or Agent: Mary M. Yawney, et al., Ex. Gp.: 210

4,580,634, Re. S.N. 936,537, Filed Nov. 26, 1986, Cl. 166/310, METHOD AND APPARATUS FOR DISTRIBUTING FLUIDS WITHIN A SUBTERRANEAN WELLBORE, Don S. Cruise, Owner of Record: *Chevron Research Co., San Francisco, Calif.,* Attorney or Agent: S. R. LaPaglia, et al., Ex. Gp.: 350

4,583,824, Re. S.N. 938,409, Filed Dec. 5, 1986, Cl. 350/267, CARDIOPULMONARY RESUSCITATION PROMPTING, Donald C. Hutchins, Owner of Record: *Inventor,* Attorney or Agent: Charles Hieken, Ex. Gp.: 250

4,603,269, Re. S.N. 934,550, Filed Nov. 24, 1986, Cl. 307/571, GATED SOLID STATE FET RELAY, Peter A. Hochstein, Owner of Record: *Inventor,* Attorney or Agent: R. P. Barnard, et al., Ex. Gp.: 250

4,606,185, Re. S.N. 937,662, Filed Dec. 3, 1986, Cl. 57/401, FRICTION SPINNING FRAME, Meiji Anahara, et al., Owner of Record: *Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya-Shi, Aichi, Japan,* Attorney or Agent: Milton J. Wayne, et al., Ex. Gp.: 240

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,565,930, Reexam. No. 90/001,141, Requested: Dec. 17, 1986, Cl. 556/83, ORGANOTIN MERCAPTO CARBOXYLIC ACID ESTER SULFIDES, Otto B. Kauder, et al., Owner of Record: *Argus Chemical Corp., Brooklyn, N.Y.,* Attorney or Agent: John R. Janes, Ex. Gp.: 120, Requester: George Rauchfuss, Jr., Stamford, Conn.

3,963,254, Reexam. No. 90/001,138, Requested: Dec. 5, 1986, Cl. 280/824, SNOW DISK FOR A SKI STAFF, Yrjo Aho, Owner of Record: *Exel Oy, Helsinki, Finland,* Attorney or Agent: None, Ex. Gp.: 310, Requester: Young & Thompson, Arlington, Va.

3,979,709, Reexam. No. 90/001,145, Requested: Dec. 19, 1986, Cl. 337/186, ELECTRIC FUSE HAVING A MULTIPLY CASING OF A SYNTHETIC-RESIN GLASS-CLOTH LAMINATE, Daniel P. Healey, Owner of Record: *Gould, Inc., Rolling Meadows, Ill.,* Attorney or Agent: Paul Edgell, Ex. Gp.: 210, Requester: The Glastic Co., Cleveland, Ohio

4,282,952, Reexam. No. 90/001,142, Requested: Dec. 12, 1986, Cl. 188/18.1, WHEEL ASSEMBLY, Francis A. Bartley, Owner of Record: *Unit Rig & Equipment Co., Tulsa, Okla.,* Attorney or Agent: Jerry J. Dunlop, Ex. Gp.: 310, Requester: Owner

4,302,921, Reexam. No. 90/001,137, Requested: Dec. 5, 1986, Cl. 56/13.6, MOWER WITH BOTTOM-DRIVEN CUTTER DISCS, Marcel Weber, Owner of Record: *Belrecott SA Zone Industrielle, Marmoutier, France,* Attorney or Agent: Barry L. Grossman, Ex. Gp.: 330, Requester: Owner

4,513,453, Reexam. No. 90/001,140, Requested: Dec. 15, 1986, Cl. 2/150, PRE-TIED NECKTIE, Jian Chen & Ching H. Chen, Owner of Record: *J. Chen & C. H. Chen, Taipei, China,* Attorney or Agent: H. I. Cantor, Ex. Gp.: 240, Requester: Viscount U.S.A., Inc., Compton, Calif.

4,536,341, Reexam. No. 90/001,143, Requested: Dec. 22, 1986, Cl. 558/13, SUBSTITUTED N-AROYL N-PHENYL UREA COMPOUNDS, Raymond H. Rigeterink, et al., Owner of Record: *The Dow Chemical Co., Midland, Mich.,* Attorney or Agent: R. G. Waterman, Ex. Gp.: 120 Requester: Owner

4,568,812, Reexam. No. 90/001,139, Requested: Dec. 12, 1986, Cl. 219/64, DEVICE FOR ELECTRIC LONGITUDINAL-SEAM MASH RESISTANCE WELDING, Walter Panknin, et al., Owner of Record: *L. Schuler GmbH, Goppingen, W. Germany,* Attorney or Agent: Craig & Burns, Ex. Gp.: 210, Requester: Soudronic Ltd., Briarcliff Manor, N.Y.

4,579,256, Reexam. No. 90/001,144, Requested: Dec. 29, 1986, Cl. 222/162, FLOWABLE MATERIAL DISPENSER, Philip R. Heimlich, Owner of Record: *Himedics, Inc., Hollywood, Fla.,* Attorney or Agent: Hayes & Reinsmith, Ex. Gp.: 310, Requester: Owner

Errata

All reference to Patent No. 4,634,577 to Richard H. Nielsen, of Bartlesville, Okla., 'FLUID FEED APPARATUS', appearing in the Official Gazette of Jan. 6, 1987, should be deleted since no patent was granted."

"All reference to Patent No. 4,632,875 to Stanley M. Barnett, Joan M. Lausier, Samuel J. Montalto, all of R.I., 'METHOD OF FORMING A POLYAPHRON', appearing in the Official Gazette of Dec. 30, 1986, should be deleted since no patent was granted."

Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Oct. 14, 1986 were mailed to 354 candidates. The following list contains the names of persons who successfully passed the examination. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) for a period of 90 days to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Mar. 6, 1987.

Aaker, Mark A., 1765 Shamrock, Santa Clara, Calif. 95051
Abel, David B., 204 38th Pl., Manhattan Beach, Calif. 90266
Abrahams, Colin P., 56 Maegan Pl. 9, Thousand Oaks, Calif. 91362
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Berninger, Mark S., 12513 Hialeah Way, Gaithersburg, Md. 20878
Bingham, Douglas A., 207 Carmelita Pl., Solana Beach, Calif. 92075
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Kolman, Ludwig E., 460 Beach St., Highland Park, Ill. 60035
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Lee, Simon K., 10365 Mary Ave., Cupertino, Calif. 95014
Levine, Charles D., 2815 Shawn Leigh Dr., Vienna, Va. 22180
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Jan. 7, 1987.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 3, 1987

4,099,321	4,584,139	4,600,801	4,616,193
4,249,524	4,584,341	4,601,542	4,616,536
4,452,249	4,585,360	4,601,575	4,616,815
4,502,325	4,587,168	4,602,329	4,617,042
4,519,050	4,587,619	4,602,549	4,617,389
4,524,467	4,587,995	4,602,790	4,617,646
4,530,497	4,588,570	4,603,263	4,617,682
4,532,588	4,588,796	4,603,795	4,617,767
4,540,204	4,589,485	4,604,892	4,618,344
4,542,849	4,589,787	4,605,719	4,618,511
4,550,217	4,590,364	4,606,949	4,619,280
4,551,202	4,591,329	4,608,082	4,619,462
4,555,700	4,591,461	4,608,887	4,620,142
4,568,492	4,591,591	4,608,910	4,620,434
4,569,111	4,593,365	4,609,771	4,620,777
4,569,492	4,593,929	4,610,172	4,621,285
4,571,053	4,594,834	4,610,955	4,621,353
4,575,221	4,595,021	4,611,421	4,621,420
4,575,503	4,595,222	4,612,242	4,621,478
4,575,522	4,595,275	4,612,243	4,621,591
4,576,980	4,595,533	4,612,879	4,621,706
4,577,034	4,595,570	4,613,046	4,621,756
4,578,162	4,595,960	4,613,101	4,621,971
4,579,082	4,596,054	4,613,169	4,622,017
4,579,174	4,597,745	4,613,609	4,622,111
4,579,294	4,598,600	4,613,790	4,622,166
4,581,425	4,598,871	4,614,376	4,622,389
4,581,880	4,599,615	4,615,183	4,622,522
4,582,063	4,599,625	4,615,197	4,622,956
4,582,140	4,600,006	4,615,777	4,623,052
4,582,417	4,600,324	4,615,904	4,624,227
4,583,593	4,600,625	4,616,130	

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Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
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	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
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	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
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	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
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	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 20, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	9-24-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	3-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	7-25-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	7-09-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	11-06-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-15-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	6-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during December 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,480,966 to 3,487,469, inclusive

Plant Patents ..... Numbers 2,945 to 2,958 inclusive

REEXAMINATIONS

FEBRUARY 3, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,736,966 (625th)
QUICK-CONNECT VENT TUBE STRUCTURE
Anthony J. Dichiara, 133-03 128th St., South Ozone Park, Queens, N.Y.
Reexamination Request No. 90/000,935, Jan. 8, 1986.
Reexamination Certificate for Patent No. 3,736,966, issued Jun. 5, 1973, Ser. No. 199,947, Nov. 18, 1971.
Int. Cl.[4] B65B *3/18*; B67C *3/00*
U.S. Cl. 141—392

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **5** is confirmed.

Claims **1–4** and **6–9** are cancelled.

5. An apparatus as defined in claim **1**, wherein said fluid outlet bore means comprises an adapter nipple for attaching said vent tube to said filling valve device, said adapter nipple having an upper threaded portion for threadingly engaging said filling valve device, a lower cylindrical portion adapted to be slidingly inserted into the open end of said hollow cylindrical member, a plurality of annular grooves in spaced relation being provided on the external surface of said cylindrical portion of the nipple, said grooves on the cylindrical member of said vent tube being interiorly thereof, and said sealing ring members interlocking said adapter nipple and said vent tube upon insertion of the latter into the former.

B1 3,799,427 (626th)
DEGASSING VALVE FOR HERMETICALLY SEALED FLEXIBLE CONTAINERS AND A CONTAINER PROVIDED WITH THE VALVE
Luigi Goglio, Milan, Italy, assignor to Flexible Packaging Research and Consulting, Amsterdam, Netherlands
Reexamination Request No. 90/000,978, Mar. 31, 1986.
Reexamination Certificate for Patent No. 3,799,427, issued Mar. 26, 1974, Ser. No. 337,870, Mar. 5, 1973.
Claims priority, application Italy, Dec. 4, 1972, 32439/72
Int. Cl.[4] B65D *31/14*
U.S. Cl. 383—103

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

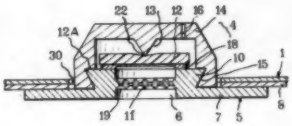
The patentability of claims **1–14** is confirmed.

1. A unidirectional degassing valve for products in thermoweldable flexible containers, characterized by comprising:

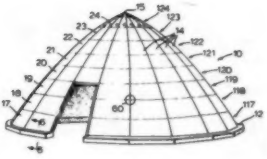
a. a thermoplastic material moulded base member provided with at least one conduit;

b. a resilient valve member normally closing said conduit and bearing on the base member through a viscous layer; and

c. a cap connected with said base member, therewith defining a chamber wherein said resilient valve member is located, and provided with at least one exhaust aperture, through which said chamber communicates with the external atmosphere.



B1 3,820,292 (627th)
BUILDING STRUCTURE
John R. Fitzpatrick, Islington, Canada, assignor to Campcore Inc.
Reexamination Request No. 90/000,787, May 24, 1985.
Reexamination Certificate for Patent No. 3,820,292, issued Jun. 28, 1974, Ser. No. 255,643, May 22, 1972.
Continuation of Ser. No. 84,318, Oct. 27, 1970, abandoned.
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—81



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. A peaked segmented building structure comprising:

a base;

a plurality of similar, upwardly convergent and inwardly sloping adjacent sectors, each supported by said base, all sectors being divided into segmental panels at their intersections with a plurality of vertically spaced, hypothetical horizontal planes, the segmental panels defined between each two adjacent horizontal planes constituting a ring of segmental panels, each segmental panel being flat and having the shape of a trapezoid of which the top and bottom edges are parallel and the two side edges are equal in length and convergent, the acute angle between the bottom edge and each side edge diminishing from one segmental panel to the segmental panel next above it, thereby to give each sector a slight outward bulge, the lowermost ring of segmental panels defining a polygon at its contact with the base;

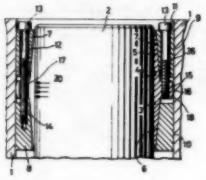
the profile of said slight outward bulge of each sector lying between a straight line and the critical curve line for the sector, and being different from either; said last-mentioned

characteristic of the profile being assured by first choosing an actual profile for each sector, by then calculating for each segmental panel in a sector its weight and length and the location of its gravitational center, by then sequentially balancing moment arms about one end of each segmental panel in order to determine the ratios between the tangents of the angles defined between the panels and the horizontal which will place the sector of segmental panels in static equilibrium from the base to the peak, by then using trail-and-error to find the set of angles which (a) satisfies the said ratios, and (b) yields the same peak-to-base angle as occurs with the actual segmental panels for which the weights, lengths and gravitational centers were determined, and finally by ensuring that the actual profile defined by the actual segmental panels lies within and is straighter than the static equilibrium profile calculated as above recited.

B1 3,958,888 (628th)
CLAMPING ASSEMBLY

Ralph Mullenberg, Nelkenstrasse 6, 4041 Hulchrath, Fed. Rep. of Germany

Reexamination Request No. 90/000,932, Jan. 6, 1986.
Reexamination Certificate for Patent No. 3,958,888, issued May 25, 1976, Ser. No. 471,156, May 17, 1974.
Claims priority, application Fed. Rep. of Germany, May 17, 1973, 2324916; Jul. 13, 1973, 2329940
Int. Cl.[4] F16D *1/06*; B25G *3/20*
U.S. Cl. 403—13



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A clamping assembly for clampingly connecting together an outer member or hub, having a bore with a cylindrical clamping surface, and an inner member or shaft receivable within said bore and having a clamping surface concentrically spaced from said bore clamping surface, the clamping assembly comprising:

a double-taper ring having concentric inner and outer peripheral surfaces, one of its peripheral surfaces being cylindrical and adapted for engagement with the clamping surface of one of the two members, the opposite peripheral surface including two oppositely slanting tapered surfaces, the tapers of said surfaces being so slanted that the ring has a maximum wall thickness in its mid-portion;

two clamping sleeves spaced apart axially and having concentric inner and outer peripheral surfaces, one pair of peripheral surfaces being tapered surfaces adapted to be seated against the tapered surfaces of the double-taper ring, the opposite pair of peripheral surfaces being cylindrical and adapted for engagement with the clamping surface of the other one of the two members;

the double-taper ring including in the space between the clamping sleeves an integral centering collar extending to the same diameter as the cylindrical peripheral surfaces of the clamping sleeves when said sleeves are in their clamped state, the double-taper ring thereby serving as a centering means between the hub member and the shaft member, when the assembly is in its unclamped state;

the assembled double-taper ring and clamping sleeves thus defining a package with concentrically spaced inner and outer cylindrical outlines;

a plurality of clamping bolts spaced along the circumference of the assembly and extending axially between the two clamping sleeves within said inner and outer outlines of the assembly, the clamping bolts reaching through one of the clamping sleeves, through a centrally located wall portion of the double-taper ring, and at least a distance into the second clamping sleeve so as to axially advance the sleeves against one another and onto the tapered surfaces of the double-taper ring, when tightened;

the angle of taper of the cooperating tapered surfaces of the double-taper ring and the clamping sleeves being at an angle at which the clamping engagement between said tapered surfaces is of the self-locking type, the clamped parts being separable by force only; and

means for forcibly unclamping each clamping sleeve from the double-taper ring by engaging its centrally located wall portion.

STATUTORY INVENTION REGISTRATIONS

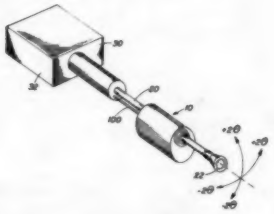
PUBLISHED FEBRUARY 3, 1987

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H202
BARREL FLEXURE CONTROL SYSTEM

Eugene Geeter, Orange, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 29, 1986, Ser. No. 870,214
Int. Cl.[4] F41F *17/00, 21/00*
U.S. Cl. 89—14.05 **9 Claims**



1. A gun barrel adapter for a barrel having a longitudinal axis comprising:

a first bearing for engaging the barrel and for acting as a first fulcrum for flexing the barrel;

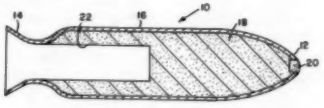
a second bearing for engaging the barrel at a location spaced along the longitudinal axis from the first bearing and for acting as a second fulcrum for flexing the barrel; and

actuator means operatively connected to said first and second bearings and engaged to the barrel between said first and second bearings for applying a lateral force to the barrel for flexing the barrel whereby a position of a muzzle of the barrel can be changed.

H203
INTEGRAL ROCKET MOTOR-WARHEAD

William B. Thomas, and Robert E. Betts, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1985, Ser. No. 695,499
Int. Cl.[4] F42B *15/10*; C06B *45/12*
U.S. Cl. 102—374 **3 Claims**

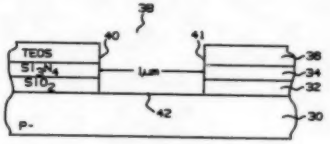


1. A rocket motor comprising a rocket motor case having a forward end which is continuous with said motor case extending from said forward end to an aft end; a nozzle secured to aft end of said motor case; a propellant grain contained within said motor case, said propellant grain being a common burning propellant and an explosive propellant, said propellant grain having an exposed outer surface which burns as an internal or perforated grain propellant during a boost phase to provide boost thrust, said propellant grain surface burning to an end-burning propellant at completion of boost phase and continuing to burn to provide sustaining thrust during sustaining thrust phase, said end-burning propellant burning surface progressing towards said forward end, said propellant grain being of such a predetermined amount to always have an amount of propellant grain remaining when said rocket motor reaches the proximity of a target; and detonator means contained in said rocket motor case and in intimate contact with a portion of said amount of propellant grain remaining and said detonator means being set off in proximity of the target to cause said amount of propellant grain remaining to be exploded and to provide an explosive force to the target.

H204
METHOD FOR IMPLANTING THE SIDEWALLS OF ISOLATION TRENCHES

Kye H. Oh, Allentown, and David S. Yaney, Bethlehem, both of Pa., assignors to AT&T Bell Laboratories

Filed Nov. 29, 1984, Ser. No. 676,250
Int. Cl.[4] B44C *1/22*; C03C *15/00*; H01L *21/00, 21/461*
U.S. Cl. 156—648 **11 Claims**



1. A method for making isolation trenches comprising substantially vertical sidewalls in a semiconductor substrate, said method comprising the steps of:

(a) depositing a predetermined thickness of a masking material over said substrate;

(b) patterning said masking material to indicate the placement of said isolation trenches;

(c) forming a spaced succession of windows through the masking material formed in step (a) in accordance with the pattern established in step (b), said windows comprising substantially vertical sidewalls and having a substantially horizontal bottom which coincides with the top surface of said substrate;

(d) performing a series of ion implantations through said windows at varying depths into said substrate to implant ions which will coincide with the substantially vertical trench sidewalls;

(e) depositing a conformally coating cover layer over said masking material formed in step (a) such that said conformal coating is also deposited into the windows formed in step (c);

(f) etching said cover layer to remove horizontally disposed conformal coating such that the remaining conformal coating completely covers the vertical sidewalls of said windows and also covers a predetermined portion of the bottom of the windows, said etched conformal coating thereby narrowing the width of said windows;

(g) etching said substrate using said masking material to produce a spaced succession of isolation trenches, wherein said isolation trenches comprise a width determined by the portion of said windows not covered by said conformal coating cover layer;

(h) removing the remaining portions of said conformal covering layer;

(i) oxidizing said isolation trenches;

(j) performing a final ion implantation to implant ions which will coincide with the substantially horizontal bottom of said isolation trench; and

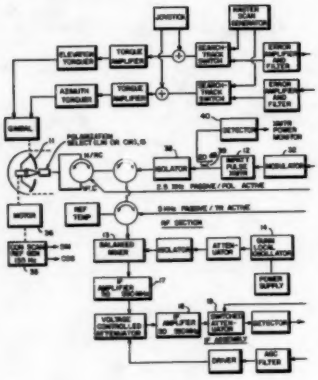
(k) thermally oxidizing and subsequently etching said substrate so as to completely fill said spaced succession of isolation trences and planarize the final structure.

H205

WIDE BANDWIDTH RADAR HAVING IMPROVED SIGNAL TO CLUTTER RESPONSE CHARACTERISTICS

George M. Green, 6500 Bear Lake Cir., Orlando, Orange County, Fla. 32810, and James R. Ashwell, 2125 Mohawk Trail, Maitland, Orange County, Fla. 32751

Filed Feb. 9, 1984, Ser. No. 578,397
Int. Cl.[4] G01S 7/28
U.S. Cl. 342—134 4 Claims



1. A wide bandwidth radar having improved signal to clutter response comprising

a radar signal pulse generating means generating a train of wide bandwidth non-coherent pulses,

modulation means effecting wide bandwidth frequency modulation of said non-coherent pulses,

transmit/receive means transmitting said train of frequency modulated pulses and receiving echo signals thereof,

a wide bandwidth IF circuit providing IF processing of said received echo signals, and

a video circuit including a detector means receiving said IF processed echo signals said detector means being effective to average the contents of each pulse thereof whereby each averaged pulse represents an estimate of the true average return from background clutter.

H206

DYNAMIC PRESSURE CALIBRATOR

Donald H. Newhall, Norfolk, Mass.; Arpad A. Juhasz, Joppa, Md.; Charles D. Bullock, Conowingo, Md., and James O. Pilcher, II, Edgewood, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

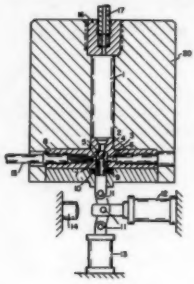
Filed Feb. 10, 1986, Ser. No. 835,857
Int. Cl.[4] G01L 27/00
U.S. Cl. 73—4 R 16 Claims

10. A method of generating high pressure, short rise time pulses, comprising:

pressurizing a large pressure chamber with a pressure fluid;

discharging the pressurized high pressure fluid from the large pressure chamber through a channel into a small pressure chamber having a volume which is a small fraction of the volume of said large pressure chamber;

confining the pressurized fluid coming from said large pressure chamber in said small pressure chamber to establish a rapid rise in pressure in said small pressure chamber to a point equaling the pressure initially established in said large pressure chamber; and



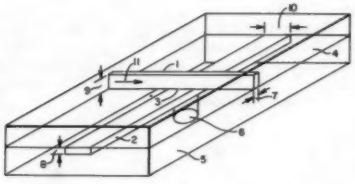
communicating to a pressure gauge the pressure rise in said small pressure chamber.

H207

OVER-UNDER DESTRUCTIVE CROSSOVER CIRCUIT

Denis A. Silvia, Aberdeen, and Herman J. Blische, Forest Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 380,204, May 20, 1982. This application Aug. 15, 1986, Ser. No. 898,543
Int. Cl.[4] F42B 3/10, 15/00
U.S. Cl. 102—275.9 19 Claims



1. A destructive crossover comprising two intersecting paths of explosive material embedded in a substrate material, said paths being a first path and a second path, wherein the cross-sectional area of each path is sufficiently large to achieve reliable detonation along that entire path and wherein the intersection is configured so that detonation of the first path reliably results in the destruction of only the cross-sectional region of the second path which is in the immediate vicinity of the intersection.

H208

PACKAGING MICROMINIATURE DEVICES

Kwok K. Ng, Union, and Simon M. Sze, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

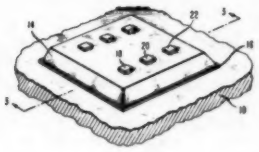
Filed Feb. 17, 1984, Ser. No. 581,336
Int. Cl.[4] H01L 23/16, 29/04, 21/00
U.S. Cl. 357—75 19 Claims

1. An assembly comprising

a wafer having top and bottom surfaces, said top surface constituting a planar uppermost surface of said wafer and said bottom surface constituting a planar bottommost surface of said wafer, said wafer having conductive terminal portions on said top surface,

at least one microminiature device mounted on the top surface of said wafer, said device having a top surface and

including conductive elements in a central portion of the top surface of said device, each device mounted on the top surface of said wafer having at least one sloped edge extending from said central portion toward the top surface of said wafer,

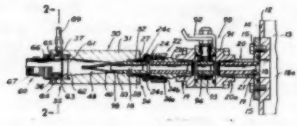


and a conductive pattern connecting the elements of each device mounted on the top surface of said wafer to said terminal portions, said pattern being disposed entirely on the sloped edge of each device and on the top surface of said wafer.

H209
DIFFERENTIAL PRESSURE PIN DISCHARGE APPARATUS

David J. Oakley, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 30, 1984, Ser. No. 615,432
Int. Cl.[4] G21C *19/02*; F16J *15/32, 15/40, 15/48*
U.S. Cl. 376—261 **5 Claims**



1. A pin discharge assembly for allowing elongate pins to be discharged from a source area having a source pressure, into a terminal area having a terminal pressure which is greater than the source pressure; comprising:

a valve having a pin passageway therethrough the conveying elongate pins being discharged from the source area; the valve having flexible lip means having a duck bill shape and extending across the pin passageway and having a lip opening therethrough for conveying pins therethrough; the flexible lip means being collapsible to prevent backflow of gases into the source area;

aspirator means connected downstream of the valve and having a pin passageway therethrough for communicating with the pin passageway in the valve to allow elongate pins to pass through the aspirator means; the aspirator means serving to intermittently produce an aspirator venturi pressure downstream of the flexible lip means which is less than the source pressure.

H210
BI-INPUT SAFE DETONATOR

Paul Harris, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 713,132, Mar. 18, 1985. This application Jan. 2, 1986, Ser. No. 815,499
Int. Cl.[4] F42C *11/02*
U.S. Cl. 102—210 **9 Claims**

1. A detonator comprising:

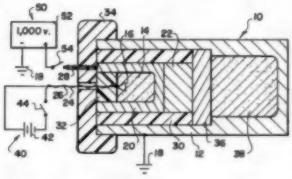
a housing;

a weak explosive charge in said housing;

a wire associated with said weak explosive charge which is activatable to ignite said weak explosive charge;

first power supply means connected to said wire for activating said wire to ignite said weak explosive charge and produce a shockwave;

a piezoelectric semiconductor buffer in said casing positioned to receive the shockwave; and

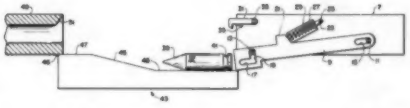


second power supply means connected to said buffer for activating said buffer to amplify the shockwave when said first power supply means activates said wire at substantially the same time that said second power supply means activates said buffer, to produce an amplified detonation wave.

H211
COMBINED EJECTOR-RAMMER FOR SMALL ARMS

William E. Vanderbeck, Ridgefield Park, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 3, 1985, Ser. No. 730,214
Int. Cl.[4] F41C *15/00, 13/00*
U.S. Cl. 42—17 **5 Claims**

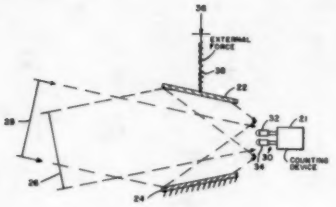


1. A mechanical device for a small caliber weapon which device is capable of performing the functions of a conventional bolt, a rammer, an extractor and an ejector, said weapon comprising a firing chamber, a feed ramp located rearwardly and below said firing chamber, a bolt assembly adapted to reciprocate above said feed ramp, one side of said bolt having an ejectomer lever attached thereto by means of a pair of pins mounted in said bolt and a spring which simultaneously urges said lever downwardly and forwardly relative to said bolt, one of said pins being located near the forward end of said bolt and moving in an L-shaped slot in said lever and the other of said pins being located near the aft end of said bolt and moving in a generally horizontal linear slot in said lever, whereby the forward end of said lever functions as a rammer to slide cartridges along said feed ramp and into said chamber and whereby during retraction of said bolt assembly following firing, said lever will move forward relative to said bolt as a result of the pressure of said spring and the sliding of said pins in said slots to eject spent cartridge cases from said weapon, and wherein said bolt has an extractor hook attached thereto.

H212
DISPLACEMENT AND FORCE MEASUREMENT BY MEANS OF OPTICALLY-GENERATED MOIRÉ FRINGES

James D. Holder, and Walter L. Hales, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 27, 1984, Ser. No. 686,767
Int. Cl.[4] G01B *11/02*
U.S. Cl. 356—356 3 Claims



1. Apparatus for displacement and force measurement by means of optically-generated Moiré fringe patterns comprising:

a. a movable mirror and a fixed mirror positioned in spaced relation;

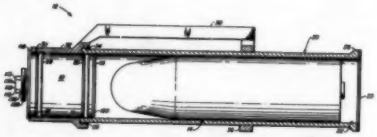
b. a pair of light sources disposed for directing separate light beams to said mirrors; said mirrors disposed to reflect portions of said light beams to an interference region where fringes are generated by interaction of the light wavefronts; and,

c. a pair of optic sensors positioned in said interference region to detect light and dark patterns of said fringes.

H213
DISICCANT PLUG FOR MISSILE LAUNCHER

Clayton E. Panlaqui, Palm Springs, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1986, Ser. No. 874,305
Int. Cl.[4] F41F *3/042*
U.S. Cl. 89—1.8 5 Claims



1. In a missile launching apparatus having:

a frame;

a launcher tube mounted on the frame and having an open forward end and an open rearward end;

a container tube having an open nose end and a hermetically closed tail end, the container tube being disposed in coaxial relation to the launcher tube with said nose end slidably received in said rearward end;

a device releasably retaining the container tube to the frame; and

a missile which is adversely affected by humidity and is disposed in the container tube between said ends thereof,

the improvement comprising:

a hollow cylindrical plug which has a periphery slidably fitted within the launcher tube and within the nose end of the container tube, has a perforate end, and has an axially opposite closed end, the plug being extended through the launcher tube with the perforate end of the plug received in the nose end of the container tube and with the closed end of the plug adjacent to the forward end of the launcher tube;

a quantity of desiccant disposed within the plug; and

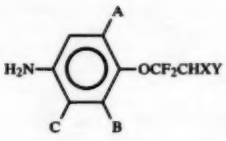
means for retaining the desiccant within the plug so that the desiccant absorbs humidity entering the plug through the perforate end thereof from the container tube.

H214
DISTILLATION PROCESS FOR THE ISOLATION OF 1,1-DIFLUORO(MONO- OR DIHALO)ETHOXYBENZENEAMINES

John C. Little, 5450 Kirkwood Dr. #C-2, Concord, Calif. 94521

Filed Jul. 19, 1985, Ser. No. 756,907
Int. Cl.[4] C07C *93/14, 43/225, 41/42*
U.S. Cl. 564—437 13 Claims

1. A process for the isolation of 1,1-difluoro-(mono- or dihalo)ethoxybenzeneamines



wherein

A, B, and C each independently represent —H, —F, —Cl, —Br, —CN, —C_1–C_4 alkyl, or —C_1–C_4 alkoxy,

X represents —F, —Cl or —Br, and

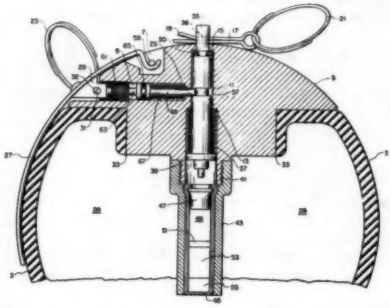
Y represents —F, —Cl, —Br or —H,

prepared by the reaction of a 1,1-difluoro(mono- or dihalo)-ethylene with a hydroxybenzeneamine in the presence of an alkali metal or alkaline earth metal hydroxide and a polar, aprotic solvent, which comprises distilling the reaction product in two stages so that the solvent and other volatile constituents are removed from the reaction mixture in the first stage by distillation at or below atmospheric pressure and the product is isolated from the residue of the first stage in the second stage by distillation under reduced pressure, without prior dilution with water and phase separation or prior treatment to neutralize said alkali metal or alkaline earth metal hydroxide.

H215
FUZE FOR RIOT CONTROL GRENADE

Paul L. Stewart, Joppa, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1985, Ser. No. 729,839
Int. Cl.[4] F42B *27/00*
U.S. Cl. 102—487 4 Claims



1. An improved fuze for a smoke-grenade comprising: a metal fuze body having a partial spherical surface provided

with a radial hole, a one-piece firing pin retainably mounted in said radial hole, said radial hole having three steps in diameter with the largest diameter housing a spring, said radial hole forming two shoulders, said firing pin having an anterior end, and interior end, and three different diameters resulting in two shoulders wherein the smallest diameter is at the anterior end, and the largest diameter having a flange adjacent said interior end, said spring mounted over said firing pin and said flange retaining said spring in said housing in an energy storing condition, said three steps of said radial hole mating with said diameters of said firing pin, said firing pin having an annular groove, said firing pin also having a second hole adjacent said anterior end, a positive safing pin mounted in said second hole holding said firing pin in a retracted position, said fuze body having an arm/safe hole at 90° to said radial hole, a slideable arm/safe pin having a shank and twin spaced-apart flanges mounted in said arm/safe hole, said shank projecting into said groove of said firing pin retaining said firing pin in the retracted position, said twin flanges of said arm/safe pin consisting of a first and second flange, said first flange retaining a second spring in the energized position maintaining engagement of said arm/safe pin with said firing pin, and said first and second flange maintaining an O-ring in a compressed position therebetween as a seal against moisture, a threaded retainer maintaining said arm/safe pin, said spring, and said O-ring in said arm/safe hole at all times, a curved handle pivoted on a pin on said fuze body, said handle normally blocking said arm/safe hole and holding said slideable arm/safe pin in said groove of said firing pin, a second positive safing pin retaining said handle in place, said arm/safe pin engaged in said firing pin in a retracted position.

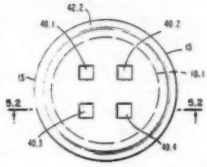
H216
METHOD FOR AND PRODUCT OF ELECTRON EMISSIVE LAYER AND MULTIBEAM CRT THEREBY

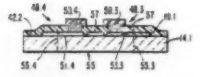
Bruce P. Piggin, Birch Lake, North Common, Sherfield English, Hants, England

Continuation of Ser. No. 612,197, May 21, 1984, abandoned, which is a continuation of Ser. No. 279,281, Jun. 30, 1981, abandoned. This application May 10, 1985, Ser. No. 733,004

Int. Cl.⁴ H01J *1/46, 21/10, 29/50*

U.S. Cl. 313—302 **1 Claim**





1. A cathode comprising:
an insulating substrate;
a metallization layer on said substrate having an essentially planar surface;
an electron emissive layer on said metallization comprising an array of needle-like particles essentially normal to said metallization surface.

H217
RECOIL MECHANISM

John K. Jorczak, Castleton, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1984, Ser. No. 685,647

Int. Cl.⁴ F41F *19/02, 19/14*

U.S. Cl. 89—43.01 **9 Claims**

1. A recoil mechanism comprising:
a hydraulic cylinder case assembly including an elongated tubular case having an imaginary central axis and end caps attached to said elongated tubular case at opposite ends thereof;
a cylindrical piston rod assembly having a body portion positoned and centered within said hydraulic cylinder case with a fluid-filled chamber between said body portion and the inner wall of said elongated tubular case, said cylindrical piston rod assembly having a portion thereof protruding through one of said end caps for sliding reciprocating motion therein and along the axis of said hydraulic cylinder case, said cylindrical piston rod assembly having a fluid-filled cavity therein and a plurality of orifices connecting said fluid filled chamber and said fluid-filled cavity;
and an elongated cylindrical tapered control rod fixed to said elongated tubular case within said fluid-filled cavity and having an outer wall spaced from the inner wall of said cylindrical piston rod assembly;
wherein upon sliding motion of said cylindrical piston rod assembly in one direction relative to said hydraulic cylinder case hydraulic fluid will be pumped from said fluid-filled chamber and through said orifices into said fluid-filled cavity to dissipate the energy of recoil.

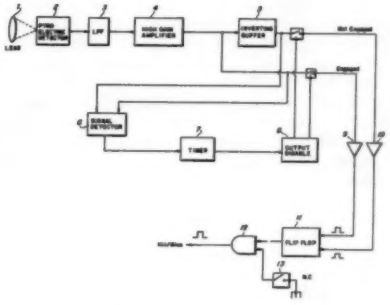
H218
WEAPON TRAINER USING IR RADIATION EMITTED FROM TARGET

Albert H. Marshall, Orlando, and Randy R. Fields, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1986, Ser. No. 862,337

Int. Cl.⁴ F41G *3/26*

U.S. Cl. 434—22 **6 Claims**



1. A weapons training device comprising:

means for detecting infrared radiation emitted by warm-blooded animals, including humans and heated targets;

a simulated rifle; and

means for detecting when the trigger of the said simulated rifle is pulled;

wherein the said means for detecting infrared radiation is mounted upon the rifle in such a manner as to detect radiation emitted by said animals at such times as the rifle is properly targeted at said animals.

H219
LAYERED CONSTRUCTION OF COMPOSITE INTERCEPTOR MOTOR CASES, ETC.

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 6, 1984, Ser. No. 577,636
Int. Cl.[4] B65H *81/00*; C06B *45/12*
U.S. Cl. 156—169 **3 Claims**

1. A method of manufacturing composite rocket motor cases wherein a fiber material having a constant strength and a curable resin having a variable formulation to yield a cured matrix from a low-modulus mechanical property value to a high-modulus mechanical property value are employed in a winding process to form successive layers of said fiber material which has been impregnated with said curable resin while passing through a filament impregnating bath containing said curable resin, said winding process when completed forming a composite rocket motor case having an innermost layer section of a highly-flexible, low-modulus mechanical property value matrix resin, an outermost layer section of rigid, high-modulus mechanical property value matrix resin, and a plurality of layer sections therebetween of intermediate modulus mechanical property value matrix resin, said method comprising:

i. providing a curable resin in a filament impregnating bath for coating a fiber material, said curable resin comprised of a first, second, third, and fourth component in a composition mixture wherein said first component is selected from diglycidyl ether of bisphenol A and a thermoplastic phenol-formaldehyde resin in predetermined parts by weight from about 25 to about 95, said second component which is epoxidized dimer of oleic acid in parts by weight from about 75 to about 5, said third component which is a reactive plasticizer of butanediol diglycidyl ether in parts by weight of about 25, and said fourth component which is an amine-crosslinking agent or curative in parts by weight about 20, said fourth component consisting of a mixture of 65 weight percent of 4,4'-diaminodiphenylmethane, 10 weight percent of triamines, and 25 weight percent of polyamines;

ii. adjusting said curable resin composition for said first, second, third, and fourth component to about 25, 75, 25, and 20 parts by weight respectively while passing a fiber material through said filament impregnating bath containing said curable resin and coating said fiber material during a plurality of predetermined winding process time period to establish said innermost layer section;

iii. readjusting said curable resin composition for said first, second, third, and fourth component to about 50, 50, 25, and 20 parts by weight respectively while continuing the passing of a fiber material through said filament impregnating bath containing said curable resin and coating said fiber material during a plurality of predetermined winding process time period to establish a first intermediate layer section;

iv. readjusting a second time said curable resin composition for said first, second, third, and fourth component to about 75, 25, 25, and 20 parts by weight after completing said first intermediate layer section respectively while continuing the passing of a fiber material through said filament impregnating bath containing said curable resin and coating said fiber material during a plurality of predetermined winding process time period to establish a second intermediate layer section;

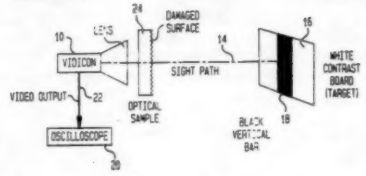
v. readjusting a third time said curable resin composition for said first, second, third, and fourth component to about 95, 5, 25, and 20 parts by weight respectively after completing said second intermediate layer section while continuing the passing of a fiber material through said filament impregnating bath containing said curable resin and coating said fiber material during a plurality of predetermined winding process time period to establish an outermost layer section; and,

vi. curing said curable resin to complete said method of manufacturing said composite rocket motor case having a variable matrix and a gradation of mechanical properties value for said innermost layer section which varies in modulus from about 80 to 100 KSI to said outermost layer section which varies in modulus from about 450 KSI to about 640 KSI.

H220
OPTICAL PERFORMANCE COMPARATOR

E. Michael Vogel, Churchville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 13, 1986, Ser. No. 845,674
Int. Cl.[4] G01M *11/00*
U.S. Cl. 356—124.5 **8 Claims**



1. An optical performance comparator for determining optical degradation of an optical device, comprising:

support means for the optical device;

target means for viewing through the optical device;

illumination means for illuminating the target means;

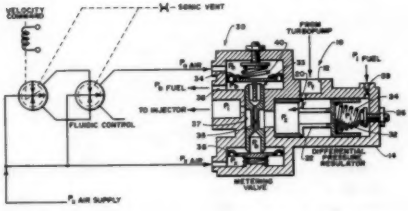
viewing means for selectively and incrementally viewing the target means through the optical device, the viewing means having an output proportional to the magnitude of light sensed by the viewing means; and

measuring means for measuring the amplitude and phase changes in the output of the viewing means with respect to time.

H221
FLUIDIC FUEL CONTROL FOR ADVANCED RAMJET ENGINES

Donald W. Chapin, Scottsdale, and John F. Thurston, Mesa, both of Ariz., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1985, Ser. No. 749,687
Int. Cl.[4] F02K *3/00*; F16K *31/12, 31/36*; F15C *1/04*
U.S. Cl. 60—243 **4 Claims**



1. A fluidic control for advanced ramjet engines comprising:

a differential pressure regulator including a first spool valve positioned in a sleeve having ports around the circumference through which fuel under boost pressure enters said first spool valve and having an orifice adapted to be connected to the fuel injector pressure sensing line and being responsive to fuel boost pressure acting against a preset tensioning means and the fuel injector pressure to provide a regulated pressure that is equal to a predetermined pressure value plus fuel injector pressure, and

a metering valve means coupled to said differential pressure regulator including a second valve member positioned in response to demand fuel control pressure acting against a duct static reference pressure to provide a fuel flow rate at said regulated pressure between a predetermined rich and lean fuel-air ratio.

REISSUES

FEBRUARY 3, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

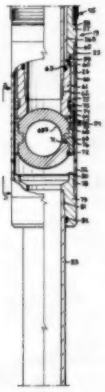
Re. 32,343
WELL SAFETY VALVE

Michael B. Vinzant, Carrollton; Steven C. Speegle, Flower Mound; Michael W. Meaders, Lewisville, and Robert L. Hilts, Dallas, all of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Original No. 4,461,353, dated Jul. 24, 1984, Ser. No. 401,005, Jul. 22, 1982. Application for reissue Mar. 20, 1985, Ser. No. 713,914

Int. Cl.[4] E21B *34/10*

U.S. Cl. 166—322 **21 Claims**



19. A safety valve comprising:

tubular housing means having longitudinal flow passage means extending through the housing means;

first port means through the housing means communicating said flow passage means with the exterior of said housing means;

valve means for controlling flow through said flow passage means including a first valve seat means, single valve member means and reciprocal actuator means for moving said valve member means relative to said valve seat means between open and closed position; and

lower annular valve seat means below said first port means engagable by said single valve member when said valve means is in open position relative to said first valve seat means;

said valve means and annular valve seat means alternatively directing flow through said flow passage means and said first port means.

Re. 32,344
SHIPPING PALLET AND A PACKAGE FORMED THEREFROM

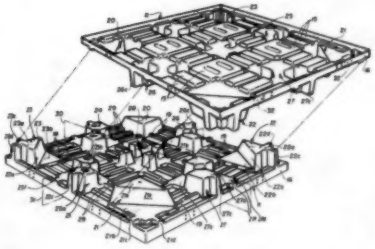
Joseph H. Wind, Taylors, S.C., assignor to Bigelow-Sanford, Inc., Greenville, S.C.

Original No. 4,413,737, dated Nov. 8, 1983, Ser. No. 295,524, Aug. 24, 1981. Continuation-in-part of Ser. No. 229,195, Jan. 28, 1981, abandoned. Application for reissue Sep. 28, 1984, Ser. No. 656,142

Int. Cl.[4] B65D *19/00, 19/38, 21/02*

U.S. Cl. 206—599 **27 Claims**

1. A shipping pallet of [the type formed of a single sheet of material and constructed] *the forkliftable type and of unitary plastic construction* for use with another substantially identical pallet so as to serve as a bottom or top wall of a shipping container for transporting and storing a load, said shipping pallet having a generally planar base and a plurality of foot means projecting from the base, said foot means including corner foot means positioned in respective corner areas of the pallet, central foot means positioned centrally of the pallet, and intermediate foot means positioned between adjacent corner foot means, and wherein each of the foot means comprises at least one projecting member and a *substantially flat* platform member adjacent each projecting member, *all of said projecting members being of hollow construction open at the upper end and tapered for nestability thereof when empty pallets are stacked with each other, said projecting members also having a height of a substantial portion of the overall height of the pallet and being arranged so as to define forklift passages between the projecting members of a substantially uniform overall height for receiving the arms of a forklift, said projecting members having flat bottom bearing surfaces for vertical load distribution and flat tapered side wall bearing surfaces for self aligning stackability, said flat tapered side walls having an overall height at least several times greater than their thickness and substantially the same as the forklift passages,* and said projecting members and said platform



members [being so constructed and arranged relative to each other] *of each foot means being symmetrically disposed with respect to the centerlines of the pallet such that said projecting members are in mirror image relation to the platform members of the corresponding foot means positioned on the opposite side of the centerlines, so* that the pallet when in use in a predetermined position of orientation, and at least another position of orientation 180° out-of-phase therefrom, may be stacked in mating relation to a substantially identical inverted pallet and with the projecting members abutting the platform members of the inverted pallet and *the flat tapered side wall bearing surfaces thereof* serving to provide a lateral anti-shift interengagement between the adjacent pallets in a plurality of directions *and wherein said height and said hollow construction and said symmetrical arrangement of said projecting members are such that said projecting members may be nestably engaged with projecting members of another substantially identical unloaded pallet facing in the same direction and in a predetermined position of orientation and at least another position of orientation 180° out-of-phase therefrom, whereby a relatively large number of unloaded pallets may be nestably stacked so as to occupy considerably less space when being stored or shipped.*

* * * * *

The questions raised in reexamination request No. 90/000,636, filed Sep. 24, 1984, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 32,345

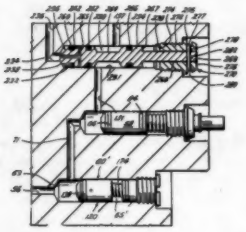
PACKER VALVE ARRANGEMENT

Edward T. Wood, Kingwood, Tex., assignor to Completion Tool Company, Houston, Tex.

Original No. 4,420,159, dated Dec. 13, 1983, Ser. No. 407,898, Aug. 13, 1982. Application for reissue Jun. 21, 1984, Ser. No. 622,957

Int. Cl.[4] E02D *5/00*; E21B *33/12*; F16J *15/46*

U.S. Cl. 277—34 10 Claims



1. In a tubular system having

a [hollow] tubular mandrel;

[a packer] *an inflatable packing element* attached to the mandrel at one end;

a valve collar mounted on the other end of the mandrel, the other end of the [packer] *packing element* being attached to the *valve* collar and the *valve* collar being in fluid communication with the [packer] *packing element* by [a] passage *means* and the *valve* collar also being in fluid communication with the interior *bore* and *the* exterior of the mandrel;

a valve system mounted [on the mandrel] *in the valve collar*, the valve system being in fluid communication with the [packer] *packing element* and the interior *bore* and *the* exterior of the mandrel, the valve system including at least one valve *means* with at least one reciprocating [member] *valve element* and [a] stop means for preventing reciprocation of the reciprocating [member] *valve element* prior to the application of at least a predetermined pressure difference to the reciprocating [member] *valve element*, the reciprocating [member] *valve element* being located [at one end of] *in one position in* the [passage] *one valve means* when the stop means prevents reciprocation, the reciprocating [member] *valve element* having at least two seals thereon for preventing the flow of fluid from either side of the [reciprocating member around the member] *seals* to the passage *means*;

the improvement comprising:

first means independent of the seals for permitting the flow of fluid from the interior *bore* of the mandrel to one side of one seal [of] *on* the reciprocating [member] *valve element*; and

second means independent of the seals for permitting the flow of fluid from the exterior of the mandrel to oppositely facing [surface] *side* of the other seal [of] *on* the reciprocating [member] *valve element*; and

third means independent of the seals for [equalizing the pressure on the other side of each of] *permitting the flow of fluid to a location between* the seals *for equalizing the pressure across the seals* to substantially [that of] *the pressure at* the exterior of the mandrel *and to the pressure in the interior bore of the mandrel.*

Re. 32,346

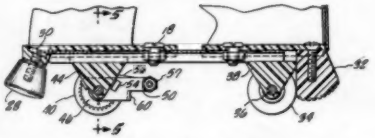
TRAINER/LEARNER SKATE

Reuben B. Klamer, Los Angeles, and Robert J. Mortonson, Seal Beach, both of Calif., assignors to Trend Products Group, Los Angeles, Calif.

Original No. 4,334,690, dated Jun. 15, 1982, Ser. No. 90,890, Nov. 5, 1979. Application for reissue May 21, 1984, Ser. No. 547,646

Int. Cl.[4] A63C *17/14*

U.S. Cl. 280—11.2 4 Claims



1. A skate comprising in combination a base plate comprising a front plate and a rear plate attached to, and adjustable on, central rail means; a pair of wheels rotatably attached to said front plate and a second pair of wheels rotatably attached to said rear plate; a ratchet gear fixedly attached to the interior of at least one of said front wheels, said ratchet gear having a plurality of teeth, said front wheels being journaled to said front plate by means of a mounting pedestal which is attached to said front plate and depends downwardly therefrom, through which said front wheels are journaled; a pawl, for engaging said ratchet to prevent rotation of said front wheels in a rearward direction, attached to said mounting pedestal by means of an operation bracket which is securely fastened to said mounting pedestal [by] *and* nut and bolt means *by which said pawl is attached to said bracket*; said pawl having a plurality of teeth; said operation bracket having a stop tab extending therefrom to restrict the rotation of said pawl thereby restricting the rotation of said front wheels; and means for quickly attaching the shoe or bare foot of a skater to said base plate.

Re. 32,347

HYPOCALCAEMIC PEPTIDES AND PROCESS FOR THEIR MANUFACTURE

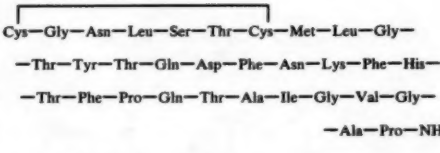
Robert Neher, Binningen, and Bernhard Riniker, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corp., Ardsley, N.Y.

Original No. 4,347,242, dated Aug. 31, 1982, Ser. No. 889,066, Mar. 22, 1978. Continuation of Ser. No. 632,928, Nov. 18, 1975, abandoned, which is a continuation of Ser. No. 488,880, Jul. 15, 1974, abandoned, which is a division of Ser. No. 253,007, May 15, 1972, abandoned, which is a continuation of Ser. No. 831,776, Jun. 9, 1969, abandoned. Application for reissue Aug. 27, 1984, Ser. No. 644,696

Int. Cl.[4] A61K *37/24*; C07K *7/36*

U.S. Cl. 514—12 18 Claims

1. The *substantially pure* dotriacontapeptide amide of the formula



its acid addition salts and complexes.

PLANT PATENTS

GRANTED FEBRUARY 3, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,870

CHRYSANTHEMUM 'WHITE REFLA'

Martinus van der Jagt, Ter-Aar, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Willemstad & Curacao, Netherlands Antilles

Filed Oct. 25, 1984, Ser. No. 664,834

Claims priority, application Netherlands, Nov. 3, 1985, CHR 834

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive variety of Chrysanthemum named 'White Refla', as described and illustrated in the foregoing specification and accompanying drawings.

5,871

CHRYSANTHEMUM 'PINK REFLA'

Martinus van der Jagt, Paradijsweg 88, 2461 TP Ter-Aar, Netherlands, assignor to Chrysanthemum Breeders Association N.V., Netherlands

Filed Oct. 25, 1984, Ser. No. 664,835

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum named 'Pink Refla', as described and illustrated in the foregoing specification and accompanying drawings.

5,872

***AECHMEA FASCINI* FRIEDERIKE**

Wilhelm Pieper, Dehmke, auf der Horst 2, 3258 Aerzen 9, Fed. Rep. of Germany

Filed Nov. 6, 1984, Ser. No. 668,874

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Aechmea fascini*, substantially as herein shown and described and characterized particularly as to novelty by the smooth margins of its leaves.

5,873

PEACH TREE

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H.P. Metzler & Sons, Del Rey, Calif.

Filed Mar. 25, 1985, Ser. No. 715,735

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by producing yellow fleshed, semi-cling fruit having a skin of bright red to yellow coloration tenacious to the flesh ripening for harvest about June 8 to June 10 when ungirdled and responding well to girdling by advancing the harvest date of the fruit several days with only a very minor percentage of splitting of the stones of the fruit.

PATENTS

GRANTED FEB. 3, 1987

ERRATA

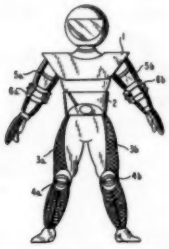
For CLASS	See PATENT NO.
131-094	4,640,013
540-312	4,640,798
540-350	4,640,799
128-323	4,640,863
379-060	4,640,986
379-062	4,640,987
379-090	4,640,988
379-094	4,640,989
379-077	4,640,990
379-088	4,640,991
379-089	4,640,992
379-383	4,640,993
379-040	4,640,127
379-001	4,640,317
379-038	4,640,318
380-003	4,641,346
380-003	4,641,347
381-103	4,641,361
381-111	4,641,377

PATENTS

GRANTED FEBRUARY 3, 1987

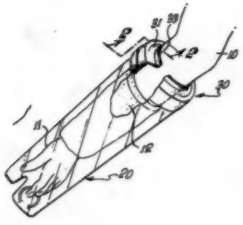
GENERAL AND MECHANICAL

4,639,944
ARMOR FOR MOTORCYCLISTS
Lester Lashley; R. Craig Lashley, and Russel E. Lashley, all of 1209 E. Madison Park, Chicago, Ill. 60615
Filed Sep. 11, 1985, Ser. No. 774,938
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **1 Claim**



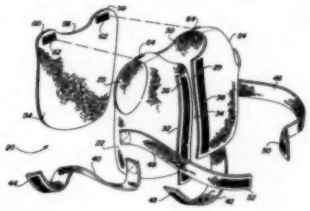
1. A protective armor for a motorcyclist, comprising, in combination, a breast plate, a waist guard, a plurality of sections of ribbed fabric; said breast plate and said waist guard being made of hard plastic; a pair of said ribbed fabric sections for covering arms and hands including raised ribbed folds at elbows, a pair of said ribbed fabric sections for covering of an outer side of thighs and a front of leg portions below the knees including raised ribbed folds at said knees all said raised ribbed folds being made of solid pieces of polyurethane plastic; elastomeric material connecting an underside of said breast plate and an underside of said waist guard to said ribbed fabric sections, and a pair of crossing straps at the rear being made of said ribbed fabric, and all said ribbed fabric sections being held in place on said motorcyclist by velcro loop fastener means.

4,639,945
PROTECTIVE METHOD AND APPARATUS
John J. E. Betz, 423 Rose Garden Ct., Reno, Nev. 89509
Filed Dec. 20, 1985, Ser. No. 811,299
Int. Cl.[4] A41D *13/00*; A61F *13/00*
U.S. Cl. 2—22 **10 Claims**



1. The method of protecting a limb from undesired moisture comprising forming a waterproof sleeve open at one end and closed at its other end suitable to encompass the limb desired to be protected from moisture; forming at the open end of the sleeve a reinforced area comprising a semi-rigid formable ring attached to the said sleeve; forming a relatively flat disk across the top of the semi-rigid formable ring said disk having a size adjustable opening therein suitable to be drawn over a limb; drawing the said device over the limb in such manner that the inner opening of the disk forms a waterproof seal about the limb.

4,639,946
RESTRAINING GARMENT WITH DETACHABLE BIB
Linda S. Koenig, 1014 S. Euclid St., Santa Ana, Calif. 92704
Filed Oct. 3, 1985, Ser. No. 783,612
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **10 Claims**



1. A garment for restrainingly holding a baby in a sitting position in a chair having a seat portion and a back rest portion, said garment comprising:

(a) a torso covering means;

(b) a first pair of elongated straps depending from opposite sides of said torso covering means for looped placement beneath the seat portion of the chair in which the baby is to be restrained;

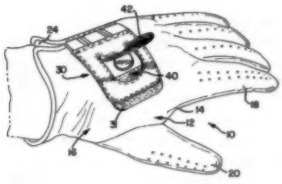
(c) fastener means on the extending ends of said first pair of straps for detachably connecting said first pair of straps to each other beneath the seat portion of the chair;

(d) a second pair of elongated straps extending rearwardly from opposite sides of said torso covering means for looped around placement in back of the back rest portion of the chair in which the baby is to be restrained;

(e) fastener means on the extending ends of said second pair of straps for detachably connecting said second pair of straps to each other in back of the back rest portion of the chair; and

(f) a bib detachably mounted on said torso covering means.

4,639,947
GOLF GLOVE
Richard Lanscioni, 1310 Oxford Rd., Deerfield, Ill. 60015
Filed Jan. 17, 1985, Ser. No. 693,272
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **12 Claims**



8. A golf glove comprising a main body having a back portion split into segments with one segment having a flap extending thererom and connectable to an adjacent segment, the improvement of said flap including first and second layers peripherally interconnected to define a pocket therein, said second layer having a cut therein defining a closure for said

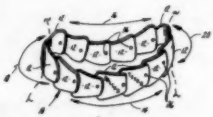
pocket connected to said second layer by an integral hinge and fastener means on said closure for connection to said first layer.

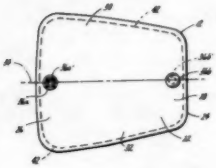
4,639,948

HIP BELT

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed May 16, 1985, Ser. No. 734,926
Int. Cl.[4] A41F 3/02
U.S. Cl. 2—338 **19 Claims**





1. A hip belt comprising a number of substantially similar pieces successively connected, each piece possessing a pliant construction of substantially uniform thickness and having a perimeter edge comprising two side edge portions and two end edge portions, said end edge portions having their lengths generally vertically disposed when the belt is being worn around the hips, one of said end edge portions of each piece being greater in length than the other end edge portion of the same piece, said side edge portions extending between said end edge portions to impart a taper to each piece which narrows in the direction from said one end edge portion to said other end edge portion thereof, and each pair of immediately successive pieces being connected together by one piece of each such pair of pieces having its other end edge portion overlapping the one end edge portion of the other piece of each such pair of pieces, and a swivel fastening device connecting each such pair of pieces at their overlapping end edge portions at a location which is essentially at the middle of the lengths of such overlapping end edge portions such that the two pieces of each such pair of pieces can swivel relative to one another about an axis passing through the swivel fastening device, which axis is generally horizontal when the belt is worn, each such swivel fastening device being a snap fastener having two separable parts snapped together, one of said parts of such a snap fastener being affixed to said one piece of each such pair of pieces at said other end edge portion therof and the other of said parts of the same snap fastener being affixed to said other piece of each such pair of pieces at said one end edge portion thereof, said one piece of each such pair of pieces containing one of said parts of another snap fastener at said one end edge portion thereof snap fastening with the other of said parts of the same another snap fastener contained in an immediately succeeding piece at said other end edge portion thereof, and said other piece of each such pair of pieces containing one of said parts of a further snap fastener at said other end edge portion thereof snap fastening with the other of said parts of the same further snap fastener contained in an immediately succeeding piece at said one end edge portion thereof.

4,639,949

ELASTIC FORM-FITTING CLOSURE CONSTRUCTIONS FOR DISPOSABLE GARMENTS

Thomas M. Ales, Winnebago County; David T. Strohbeen, Outagamie County; Joyce A. Damico, Winnebago County; Paul T. Van Gompel, and Kent W. Abel, both of Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 10, 1985, Ser. No. 690,348
Int. Cl.[4] A41B 9/00; A61F 13/16
U.S. Cl. 2—400 **12 Claims**

1. In a disposable garment including an outer marginal portion of material and an interior marginal portion of material along a part of said garment intended to fit around a portion of a wearer's body, and an elastic element joined thereto to provide an elasticized opening for said garment,

the improvement wherein:

said elastic element includes an exterior surface disposed in mutually facing relationship with said outer marginal portion of material and an inner surface joined to said interior marginal portion of material,

an outer edge portion of said elastic element, said outer marginal portion of material, and said interior marginal portion of material are substantially coincident,

said outer marginal portion of material has a thickness in the range of about 0.0003 to about 0.03 inches, and a flexural rigidity in the range of about 0.002 to about 0.1 cm-g, and

a plurality of bond points are uniformly disposed between and join together the mutually facing said elastic element exterior surface and said outer marginal portion of material, the area of each said bond point is between about 0.05 to about 3 mm^2, the distance between adjacent ones of said bond points in the direction of elongation of said elastic element prior to joining said elastic element to said outer marginal portion is between about 0.05 to about 4 mm, and the total area of said bond points is between about 5% to about 80% of the area of the mutually facing said exterior surface and said outer marginal portion,

said elastic element is joined to said bond points when in an elongated condition and remains joined only to said bond points when in a retracted condition to provide an elasticized opening having micro-ribbing of said outer marginal portion of material between said bond points.

4,639,950

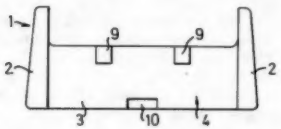
METHOD OF AND MEANS FOR HOLDING A SECURING MEMBER IN AN EXISTING ATTACHMENT SLIT

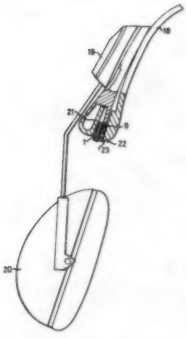
Leif Palmaer, Kristinagatan 14, Värnamo, Sweden

Filed Nov. 1, 1984, Ser. No. 667,412
Claims priority, application Sweden, Nov. 30, 1983, 8306589
Int. Cl.[4] A42B 1/24
U.S. Cl. 2—422 **7 Claims**

1. A method of holding a securing member in an existing attachment slit, the securing member having a portion for introduction into said attachment slit, the method comprising providing a substantially wedge-shaped locking adaptor, providing the locking adaptor with at least one engagement element, providing a complementary engagement element on said

portion of the securing member, introducing said portion of the securing element into said attachment slit, introducing the locking adaptor into said slit so that it engages said portion of the securing member and so that said engagement element of





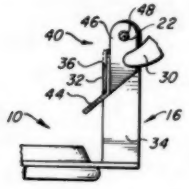
the locking adaptor co-operates with said complementary engagement element of said securing member while the locking adaptor, together with said portion of the securing member substantially fills the attachment slit, thus wedging the securing member in position in the attachment slit.

4,639,951

WEAR PLATE FOR FLUSH VALVE ASSEMBLY

Jerzy Lamot, 232 N. George Mason, #1, Arlington, Va. 22203

Filed Feb. 25, 1986, Ser. No. 832,657
Int. Cl.[4] E03D *1/35*
U.S. Cl. 4—392 **6 Claims**



1. In a tank outflow valve for a flush closet, with said valve mounted on an arm for pivotal swinging movement, about a horizontal axis through a path between a lower valve-closed position and an upper valve-open position wherein the valve mounting includes pivot shaft at said axis for said arm, said arm having a stop extension thereon, and a rigid support for said pivot shaft means, said support including a wall portion thereof interposed in the path of said arm stop extension, thereby to be engaged by said extension during valve-opening arm swinging movement,

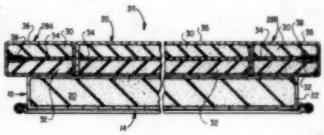
the improvement therein comprising an auxiliary wear plate having means for mounting said wear plate in proximate relation to said support wall portion and wherein the wear plate is in intercepting relation to said valve arm stop extension, thereby to preclude engagement of said extension with said wall portion.

4,639,952

CONVERTIBLE BEDDING ASSEMBLY AND MATTRESS

Roger C. Kensinger, 6211 W. Northwest Hwy., #2100, Dallas, Tex. 75225

Filed Jan. 28, 1985, Ser. No. 695,549
Int. Cl.[4] A47C *17/04, 27/05, 27/16*
U.S. Cl. 5—13 **2 Claims**



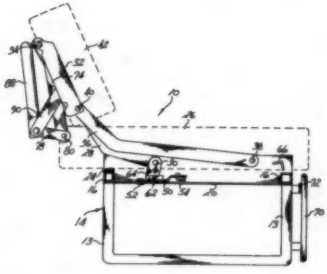
1. A convertible bedding assembly comprising a sofa, a chair, or other furniture portion; a foldable frame assembly operatively attached to said portion for movement between an expanded position and a folded position; a first mattress disposed on said frame assembly; and a second mattress extending over said first mattress in at least said expanded position, said second mattress comprising a flexible, resilient pad, a wire layer overlying said pad, a strip of rigid material extending along, and secured to, the edge portions of said wire layer, and an additional flexible resilient pad overlying said wire layer and said rigid material to form a composite assembly; said second mattress being formed by a center piece and two side pieces extending to both sides of said center piece and connected to aid center piece in a manner to permit said side pieces to fold towards said center piece; the width of said second mattress exceeding the width of said first mattress and being at least equal to the width of said frame assembly; and length of said second mattress exceeding the length of said frame assembly and said first mattress.

4,639,953

ROLLOVER BACK SOFA BED

Terry J. McElmurry; H. Coleman Davis; William B. Leftwich, all of Elkhart, Ind., and David Markel, White Pigeon, Mich., assignors to Coachmen Industries, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 642,765, Aug. 21, 1984. This application Dec. 31, 1984, Ser. No. 687,829
Int. Cl.[4] A47C *23/00*
U.S. Cl. 5—43 **4 Claims**



1. In a convertible sofa bed having a base frame which includes a generally horizontal seat, a back rest, and a pair of arms, control link means connecting said back rest to said base frame for rollover movement of said back rest between a sofa

position wherein the back rest is generally upright and a bed position wherein the back rest is forward of said seat, the improvement wherein said arms are mounted for shiftable movement outwardly of said seat, means associated with said base frame and arms responsive to said rollover movement of the back rest for accommodating said shiftable movement of the arms outwardly of said seat, said arms hingedly connected to said base frame, said means for accommodating said arm movement including pivot means connecting said arm to said base frame and camming means associated with said link means for contacting said pivot means upon said roll over movement of the back rest, said pivot means upon cam means contact for allowing outwardly hinged movement of said arms, a support member pivotally connected to said back rest, second control link means pivotally connected between said first mentioned link means and said support member, said second control link means for shifting said support member between a retracted position behind said back rest when the back rest is in its said sofa position and a support position under said back rest and contacting a floor when the back rest is in its said bed position.

4,639,954

MATERNITY BED

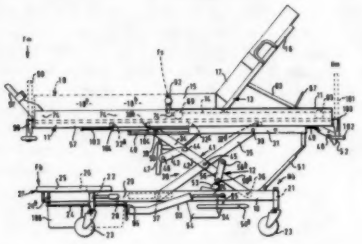
Philip Speed, Solihull, United Kingdom, assignor to Hoskins Limited, Birmingham, England

Filed Jul. 20, 1984, Ser. No. 632,952

Claims priority, application United Kingdom, Oct. 1, 1983, 8326357; Apr. 24, 1984, 8410379

Int. Cl.[4] A61G *7/06*

U.S. Cl. 5—63 **11 Claims**



1. A maternity bed comprising a mattress main frame extending longitudinally between a foot end and a head end, a base frame extending longitudinally between a foot end and a head end, a jacking means to support the main frame on the base frame and to permit of the height of the main frame relative to the base frame being varied, a mattress sub-frame movably mounted on the main frame for movement longitudinally of the main frame towards and away from the foot end of the main frame, the sub-frame comprising a base part having a foot end and a head end supporting a mattress intermediate portion having a foot end and a head end, and a backrest part supporting a mattress head portion and which is adjustable relative to the base part between a flat position in which the top surfaces of the mattress intermediate and head portions lie in a common plane, and an upright position in which the mattress head portion is inclined upwardly relative to the mattress intermediate portion at a maximum permitted angle, the main frame having means to support a mattress foot portion at the foot end of the main frame when the sub-frame is at the head end of its permitted movement, the mattress foot portion being movable away from the foot end of the main frame to permit of the sub-frame being moved towards the foot end of the main frame, the base part of the sub-frame and mattress intermediate portion each having an open-mouthed recess extending inward from the respective foot end towards the respective head end and each recess facing towards the foot end of the main frame, the main frame and the base frame each having a superposed open-mouthed recess extending inward from the respective foot end towards the respective head end and facing outwardly away from the respective foot end, to permit of access to the perineal region of the mother from below when the sub-frame is at the foot end of its permitted travel.

4,639,955

DEVICE FOR MOVING A PATIENT FROM HIS BED

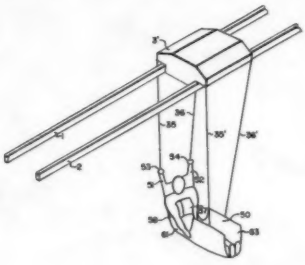
Armelle Carminati, 47 rue des Marmuzots, 21000 Dijon; Edouard de Buyer, 9 rue des Pommerelles, 60200 Compiegne; Nicolas Monomakhoff, 10 rue Firmin Gillot, 75015 Paris, and Roland Chanut, 108 route de la Douane, 69126 Brindas, all of France, assignors to Armelle Carminati, Dijon; Edouard de Buyer, Compiegne and Nicolas Monomakhoff, Paris, all of, France

Filed Jul. 29, 1985, Ser. No. 760,031

Claims priority, application France, Aug. 2, 1984, 84 12439

Int. Cl.[4] A61G *7/08*

U.S. Cl. 5—81 B **15 Claims**



1. A device for moving a patient, comprising:

a support means for receiving the patient, said support means being made from a unitary supple cloth, said support means comprising:

a first portion adapted to receive and maintain a head of the patient;

a second portion adapted to receive and maintain a main body portion of the patient; and

a third portion adapted to receive and maintain legs of the patient;

a trolley comprising means for actuating cables connected to said support means for lifting said support means loaded with the patient vertically and for horizontal displacement thereof, comprising:

a first pair of cables connected to the first part of said support; and

a second pair of cables connected to the third part of said support;

a lifting motor for lifting and lowering said first and second pair of cables; and

a translation motor for moving said trolley horizontally; and at least one rail for displacement of said trolley thereon.

4,639,956

MATTRESS SUPPORT FOR CRIB

Louis Shamie, 630 Avenue V, Brooklyn, N.Y. 11225

Filed Nov. 20, 1984, Ser. No. 673,476

Int. Cl.[4] A47D *7/00*; A47C *19/00*

U.S. Cl. 5—93 R **6 Claims**

1. A mattress support for a crib having a frame with inner surfaces which define a space, said frame having one end and an opposite end and one side and an opposite side, the mattress support comprising:

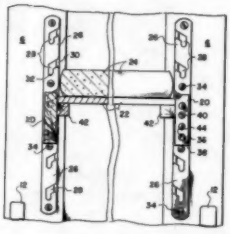
a first pair of spaced apart vertical posts at the one end of the frame, each having an inner surface facing the opposite end of the frame;

a second pair of spaced apart vertical posts at the opposite

end of the frame, each having an inner surface facing the one end of the frame;

a vertical bracket connected to each of said vertical posts, each vertical bracket being connected on said inner surface of its vertical post, each vertical bracket having a plurality of vertically spaced slots, each slot having an open mouth and a blind base positioned vertically below the open mouth, the open mouths of slots of each bracket at the one end of the frame facing each other and the open mouths of slots of each bracket at the opposite end of the frame facing each other, the blind bases of slots at each end of the frame being spaced from each other by a greater amount than the open mouths of slots at each end of the frame;

a pair of mattress support beams extending between said first and second pair of vertical posts, one of said mattress support beams being positioned on the one side of the frame and the other of said mattress support beams



being positioned on the opposite side of the frame, each mattress support beam having a pair of fixed pins extending from each end thereof, each pair of fixed pins being insertable into a pair of said open mouths and being seated in a pair of said blind bases of a different vertical bracket, pins at a one end of each beam being seated in blind bases of vertical brackets of said first pair of vertical posts and pins at an opposite end of each beam being seated in blind bases of vertical brackets of said second pair of vertical posts;

a cross member engaged between and on said pair of mattress support beams for holding each pin seated in its blind base, said cross member acting as stop means for holding said mattress support beams apart, said cross member extending substantially the full length of said mattress support beams from the one end of the frame to the opposite end of the frame and substantially spanning the distance between said support beams from one side of the frame to the opposite side of the frame.

4,639,957

BEDDING AND SEATING PRODUCT HAVING DOUBLE TWIST COIL SPRING AND METHOD AND APPARATUS FOR MANUFACTURING THE SAME

Thomas J. Wells, Carthage, Mo., and Angelo Serafini, East Boston, Mass., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

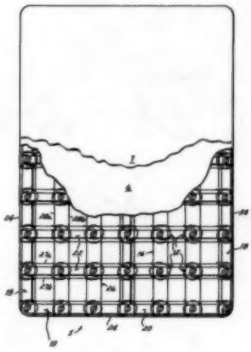
Filed Aug. 27, 1985, Ser. No. 769,947
Int. Cl.[4] A47C *23/04*
U.S. Cl. 5—248 **24 Claims**

1. A bedding foundation box spring comprising,

a bottom, substantially planar, rectangular, base frame having side and end members and slats extending between said side members,

a substantially planar rectangular top wire grid, said grid comprising a border wire and first and second sets of wires, said border wire being of rectangular configuration and surrounding said first and second sets of wires, said first set of wires comprising a plurality of longitudinally extending, spaced, parallel wires and said second set of wires comprising a plurality of transversely extending, spaced, parallel wires, said first and second sets of wires intersecting one another and being welded together at their intersections, said first and second sets of wires being fixedly connected to said border wire,

a plurality of double twist coil springs interconnecting said base frame and said wire grid, said double twist coil springs each having one end convolution substantially located in the plane of said base frame and a second end convolution located in the plane of said wire grid, each of said coil springs comprising a single length of spring wire having a middle section and a pair of spring arms, said middle section of said spring wire having a pair of opposite ends, said opposite ends of said middle section of said



spring wire being located in a diametral plane of said one end convolution, said pair of spring arms of said spring wire being coiled in the same rotational direction from said opposite ends of said middle section of said spring wire and formed into a helix of increasing pitch extending from said first end convolution toward said second end convolution and over a major portion of the axial length of said coil, said first end convolution being fixedly secured to said base frame and the ends of said spring arms of said spring wire remote from said middle section being fixedly secured to said top wire grid,

a fabric pad overlying said top wire grid, and

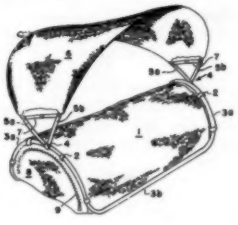
an upholstered covering encasing said base frame, wire grid, border wire, double twist coil springs, and said fabric pad.

4,639,958

COMBINED HEAD REST, SUN SHADE AND BAG

Reuben Lerner, 88 Arlozorov Street, Holon, Israel

Continuation of Ser. No. 478,255, Mar. 24, 1983, abandoned. This application May 31, 1985, Ser. No. 740,011
Claims priority, application Israel, Jan. 31, 1983, 67800
Int. Cl.[4] A47G *8/06*; A45C *9/00*; B65D *30/00*
U.S. Cl. 5—418 **7 Claims**



1. A device for use as a head rest and sun shade and a bag for

carrying articles therein, comprising a stiff skeleton, a closable bag supported on said skeleton to provide a flexible head rest, and a foldable sun shade connected to said skeleton, said skeleton including laterally spaced apart, upright side frame members at respective lateral ends thereof and connecting frame means separate from said closable bag extending laterally between said side frame members to connect said side frame members, said bag having a flexible upper portion extending between and stretched by said frame members and said frame members supporting said flexible upper portion against collapse onto a lower portion of said bag to provide the flexible head rest and further to provide between said upper and lower portion a hollow space within said bag for storage of articles in said bag even during use of said device as a head rest, and said flexible upper portion being attached at its lateral ends to said upright side frame members by loops.

4,639,959

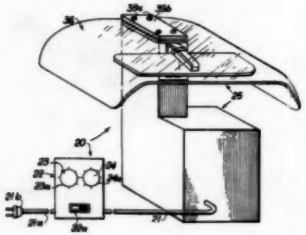
WAVE GENERATOR FOR WATERBEDS

Abel Roca, 11480 SW. 131 St., Miami, Fla. 33176

Filed Aug. 5, 1985, Ser. No. 762,684

Int. Cl.⁴ A47C *27/08*; A47D *9/02*; A61H *1/00*

U.S. Cl. 5—451 **13 Claims**



1. A wave generating paddle unit a waterbed assembly, comprising a horizontal surface supporting a water-filled mattress and a frame surrounding the periphery of the mattress, said unit comprising a housing having a bottom wall adapted to rest in an operative position on said horizontal surface, said housing having a vertical wall enclosing a vertical chamber and adapted to abut said frame and dislodge an edge portion of said mattress when in said operative position, an opening formed in said wall at the upper end of the vertical chamber facing said mattress, an electric motor located within said housing and supported on said bottom wall, an arm pivoted at one end to a support means at the upper end of said vertical chamber and having an opposite end projecting through said opening, a paddle supported by said arm opposite end adapted to overlie and engage the upper surface of said mattress adjacent said edge portion, and linkage drive means for converting rotary motion of said motor to reciprocating motion, said drive means extending through said vertical chamber interconnecting said motor and arm to pivot the latter in a vertical plane between a substantially horizontal position and a downwardly inclined position whereby said paddle rhythmically depresses and releases said mattress to create waves in the surface thereof radiating from said paddle.

4,639,960

RECLINER FOR MEDICAL CONVALESCENCE

Jeffrey B. Quillen, P.O. Box 144, Mooresville, Ind. 46158, and James G. Spahn, 4500 Kessler Blvd. East Dr., Indianapolis, Ind. 46220

Filed Apr. 16, 1985, Ser. No. 723,818

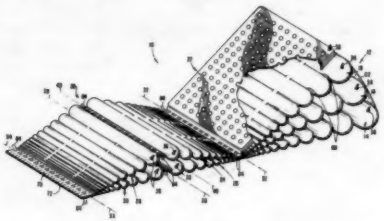
Int. Cl.⁴ A47C *27/10*; A61G *7/04*

U.S. Cl. 5—455 **11 Claims**

1. A portable recliner for supporting a person in a supine position adapted to be positioned on a bed, comprising:

a substantially triangular back and head support extending upwardly at an angle between 30 degrees and 45 degrees and including a plurality of individual wedge shaped, air inflatable, cushions with a support surface of a first length equal to at least the distance between the coccyx and the top of the head and positioned and interconnected together in a vertical stack;

a substantially triangular leg and foot support extending from an edge area adjacent the back and head support upwardly at a first angle between 20 degrees and 30 degrees for elevation of the popliteal fossa through a second angle between 120 degrees and 150 degrees and including



a plurality of individual wedge shaped, air inflatable, cushions with a support surface of a second length equal to the distance between the coccyx and the popliteal fossa and positioned and interconnected together in vertical stacks;

a valve on said cushions operable to allow inflation of each at a desired internal air pressure to determine said angles;

connecting means interconnecting said back and head support and said leg and foot support together, and including connecting means interconnecting said cushions of said leg and foot support together.

4,639,961

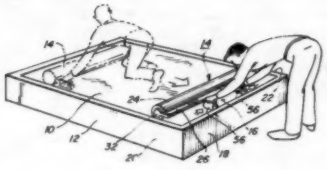
SYSTEM FOR REMOVING AIR FROM WATERBED

Dow B. Chasan, 399 Indian Hill, Buffalo Grove, Ill. 60090

Filed Aug. 29, 1984, Ser. No. 645,346

Int. Cl.⁴ A47C *21/00*

U.S. Cl. 5—508 **10 Claims**



1. A device for removing air from a waterbed having a water/air valve which comprises:

an elongated cylindrical roller having a length that is substantially the width of the bed;

a roller support member connected at opposed ends of the cylindrical roller, with the roller being rotatable with respect to the roller support member;

means for grasping the roller support member to enable manual movement of the roller over a substantial length of the waterbed to provide longitudinal compression of the waterbed;

lateral movable means coupled to the roller support member for providing lateral compression in addition to the longitudinal compression provided by the elongated roller;

said roller support member comprising a rack having sliding means parallel to the axis of the roller; said lateral movable

means being connected to said slidable means whereby said lateral movable means is slidable with respect to said roller support member.

4,639,962

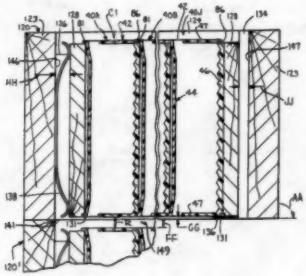
APPARATUS FOR COMB HONEY

John A. Hogg, 2225 S. 36th St., Galesburg, Mich. 49053

Continuation-in-part of Ser. No. 581,762, Feb. 21, 1984, abandoned. This application Dec. 28, 1984, Ser. No. 687,314

Int. Cl.[4] A01K *47/02*

U.S. Cl. 6—2 R **21 Claims**



1. In a device for producing comb honey in a hive, the combination comprising:

a super having opposed sides;

a plurality of similar honey cassettes stacked top to bottom to form a column extending between said sides of said super;

means operatively associated with said column of cassettes and said super for pressing together said cassettes axially of said column;

connecting means between each adjacent pair of cassettes and between endmost cassettes and the opposed sides of said super for positively blocking dropping of a given cassette from said column toward the bottom of said super and for resisting bending of the middle of said column down toward the bottom of said super, the middle of said column being free of direct contact with or support by said super.

4,639,963

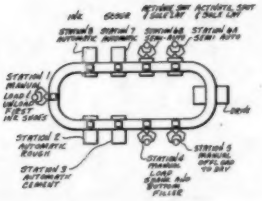
SHOE MANUFACTURING SYSTEM

Lee K. Fisher, Birmingham, Mich., assignor to Cargill Detroit Corporation, Clawson, Mich.

Filed Jun. 4, 1984, Ser. No. 616,849

Int. Cl.[4] A43D *3/00, 25/00*

U.S. Cl. 12—1 A **16 Claims**



1. Shoe manufacturing system to cement lasted uppers and outsoles comprising a plurality of sequential operation stations including an automatic cement dispensing station, non-synchronous pallet conveyor system means extending through said stations, a plurality of pallets movable in non-synchronous sequence to and through said stations, means for stopping and accurately locating individual pallets at said cement dispensing station in non-synchronous relation to pallets being stopped and located at other of said operation stations, lasted shoe upper fixture means on each pallet to hold any of a family of lasted shoe uppers of different size and style in a predetermined position on said pallet, identification means for each individual shoe size and style on each individual pallet when located for cement dispensing operation at said cement dispensing station, and programmable cement dispensing means responsive to said identification means selectively movable along different predetermined dispensing paths for different shoe sizes and styles.

4,639,964

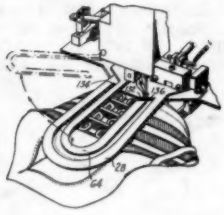
AUTOMATIC JOIN AND SEW PROCESS FOR SHOES

Hans Binder, Vienna, Austria, assignor to USM Corporation, Farmington, Conn.

Filed May 6, 1985, Ser. No. 731,446

Int. Cl.[4] A43D *100/00*; D05B *21/00*

U.S. Cl. 12—142 LC **3 Claims**



1. A process for joining pieces of a shoe together utilizing an automatic sewing machine, said process comprising the steps of:

orienting a shoe upper in a predefined position within the automatic sewing machine;

clamping the thus oriented shoe upper;

registering a pair of eyelet pieces on the thus oriented and clamped shoe upper;

positioning an eyelet cover piece over the thus registered pair of eyelet pieces;

temporarily holding the thus positioned eyelet cover piece while forming a line of stitches along the outer periphery of the positioned eyelet cover piece.

4,639,965

BRUSH FOR CLEANING CLOTHES

Nobuhiko Suzuki, Post No. 432, 2114-18, Tomitsuka-Cho, Hamamatsu City, Shizuoka Prefecture, Japan

Filed May 15, 1985, Ser. No. 734,330

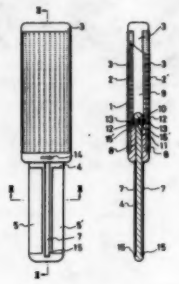
Claims priority, application Japan, May 17, 1984, 59-072265

Int. Cl.[4] A47L *25/00*

U.S. Cl. 15—104 A **3 Claims**

1. A brush comprising: an outer sheath having a hollow cavity and a longitudinally extending axis and two pieces of woven cloth respectively arranged on two opposite outer surfaces of said outer sheath in such a way that the protruding fibers on both pieces of woven cloth are tilted in substantially the same direction at right angles to the axis of the sheath, and a flat rod that is inserted in the cavity of the outer sheath so as to be withdrawable from the sheath in the direction of the axis

of the sheath and that has at least one porous member mounted thereon, said porous member having a number of small protru-



sions on its surface for removing fuzz, the rod being usable as a handle when the rod has been withdrawn from the sheath.

4,639,966

WINDSHIELD WIPER DEVICE

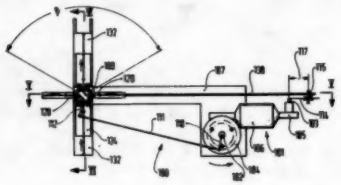
Gerd Kübbauch, Bühlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,878

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 3411160

Int. Cl.[4] B60S *1/20*

U.S. Cl. 15—250.23 23 Claims



1. A windshield wiper device for motor vehicles, comprising a pane wiper oscillatingly pivotally movable over a pane to operation positions and to a reverse position and including a wiper blade being pressed against the pane, and a wiper arm connected to said wiper blade; a first driving means (**110, 111**) for driving said wiper in its oscillating pivotal movement; a second driving means (**114**) for imparting to said wiper a reciprocal straight-line movement; transmitting means connected to said wiper and engaged on said second driving means, said transmitting means acting on said wiper in dependence on an angle (α) defined between the wiper when the latter is in its reverse position and the wiper when the latter is in a respective operation position, said transmitting means including at least one rope-like element, said first driving means and said second driving means each including a drive shaft, a reduction gear connected to the drive shaft, and a crank also connected to the drive shaft; a common drive motor connected to each reduction gear, the reduction gears operating to differently reduce the number of revolutions of each drive shaft; said first driving means including an oscillation drive (**110, 111, 112**) connected to said wiper arm, said drive shaft (**102**) of the first driving means acting on said oscillation drive, said wiper further including an oscillating shaft (**109**) connected to said wiper arm, said oscillation drive having a driven member (**112**) connected to said oscillating shaft; and a driving rod (**38, 138**) having an end connected to said rope-like element (**46**), the drive shaft (**103**) of the second driving means acting on said driving rod, said wiper arm (**14**) including an inner portion (**24**) rigidly connected to said oscillation drive and an outer portion (**32, 132**) connected to said wiper blade (**16**) and being guidably displaceable on said inner portion in a direction of elongation of said wiper arm, said rope-like element extending through said inner portion and being secured at an end thereof to said outer portion.

4,639,967

TAPE WIPING BRUSH, PARTICULARLY FOR MAGNETIC TAPE CASSETTES AND THE LIKE

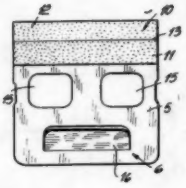
Abramo Bordignon, Senago, Italy, assignor to A.T.B. S.p.A., Senago, Italy

Filed Mar. 14, 1984, Ser. No. 589,422

Claims priority, application Italy, Apr. 14, 1983, 20596 A/83

Int. Cl.[4] G11B *23/04*

U.S. Cl. 15—256.5 8 Claims



1. A tape wiping brush, particularly for magnetic tape cassettes and the like, comprising a flexible reed extending over a substantially flat length and defining, at opposed ends, a mounting zone for attachment to a cassette and a tape pressure zone having a contact liner attached thereto, characterized in that said contact liner has a flap extending along a tape contacting edge at the opposite end to said mounting zone, said flexible reed being formed, at said contact edge, with a fold line extending in a substantially orthogonal direction to the direction of movement of said tape to define a portion sloping away from said tape, said flap being secured on said sloping portion of said reed.

4,639,968

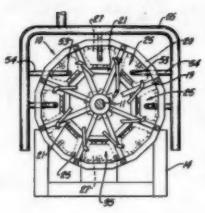
MACHINE FOR CLEANING CASTINGS

Kenneth D. McKibben, Defiance, Ohio; Alan P. Gould, Au Gres, Mich.; Craig J. Groh, Standish, Mich., and Thomas E. Wuepper, Alger, Mich., assignors to Seaton SSK Engineering Inc., Au Gres, Mich.

Filed Aug. 5, 1985, Ser. No. 762,625

Int. Cl.[4] B08B *5/02*

U.S. Cl. 15—304 7 Claims



1. A machine for cleaning debris, such as sand out of castings which have side openings internally connected to end openings, such as engine block castings and the like comprising:

a ferris-wheel-like frame mounted for rotation upon a horizonal axle and have a number of circumferentially separated, casting receiving compartments which open horizontally, that is parallel to the axle;

means for horizontally loading and unloading a casting into the compartment loaded in the lowermost position while the frame is momentarily stationary;

said frame being indexably rotatable after each lowermost compartment is loaded with a casting, to locate each next succeeding compartment in the lowermost position for unloading and loading castings so that the castings rotate, within their respective compartments, around the axle from the lowermost position of the compartment 360° back to the lowermost position;

moveable nozzles mounted in each compartment arranged to enter the side openings of the casting in such compartment;

and means for moving and holding the nozzles in said openings during the times that the frame is rotating and for moving the nozzles out of the openings in the castings when the frame is momentarily stationary, i.e. during the times that the lowermost compartment is unloaded and loaded;

stationary nozzles mounted adjacent the frame, along side of the compartments, and located so that they aim into the end openings in the castings at each compartment, except for the lowermost one during the time the frame is stationary;

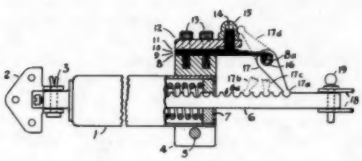
and all of said nozzles carrying pressurized air for blowing into their respective side and end openings and into the cavities within the casting which connect such openings for blowing debris out of the casing.

4,639,969

DOOR CLOSER MECHANISM

D. Noel Obenshain, Rte. 1, Box 1191, Swanton, Md. 21561

Filed Jan. 9, 1985, Ser. No. 690,102
Int. Cl.⁴ E05F *3/02*
U.S. Cl. 16—70 **2 Claims**



1. An improved door closer mechanism of the type comprising a piston-cylinder assembly pivotally mounted on one side to a door by means of a first bracket and on the other side to a wall by means of a second bracket, the improvement comprising:

a series of grooves or notches on the piston rod of the piston-cylinder assembly;

a mounting block clamped to the cylinder of said piston-cylinder assembly;

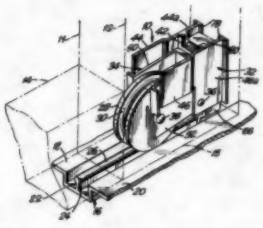
a number of flat springs clamped onto said mounting block, one flat spring proximate said cylinder having one end distant from said block that is bent to form a bearing for a pivot shaft; a pawl mounted on said pivot shaft; and means for adjusting the distance between the distal end of said one flat spring and the piston cylinder assembly, whereby the pawl will engage a selected one of said grooves or notches upon closing of the door so that the door will be slowed or stopped at a selected point.

4,639,970

ROLLER ASSEMBLY WITH STABILIZER ELEMENTS FOR SLIDING PANELS

Sherman C. Adams, Bradenton, Fla., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Nov. 29, 1984, Ser. No. 675,986
Int. Cl.⁴ E05D *15/06*
U.S. Cl. 16—90 **8 Claims**



1. A roller assembly unit adapted for installation in a panel for slidably mounting the panel on a horizontal guide track having a rail facing and parallel to one edge of the panel, comprising:

(a) a roller having a peripheral groove for bearingly receiving the rail;

(b) means for rotatably mounting said roller, said mounting means being mountable in the panel with said roller positioned to receive the rail in said peripheral groove as aforesaid; and

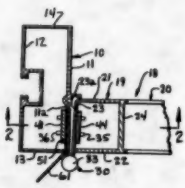
(c) a rigid stabilizer element, carried by said mounting means, having a generally U-shaped extremity positoned for overlying the rail in tandem relation to said roller, said U-shaped extremity having spaced legs respectively disposed to project on opposite sides of the rail in laterally overlapping relation thereto, for preventing lateral displacement of the roller relative to the rail, when said mounting means is mounted in the panel and the rail is received in the roller groove, said U-shaped extremity having a bridging portion between said legs for engaging the rail when said legs project on opposite sides of the rail as aforesaid, said bridging portion being constituted of a material providing a low-friction surface for ease of sliding contact of the bridging portion with the rail, and said stabilizer element being freely vertically movable in said mounting means at least through a substantial range of positions such that the stabilizer element rides floatingly on the rail, with said bridging portion engaging the rail, when said mounting means is mounted in the panel and the rail is received in the roller groove,

(d) said mounting means including vertical wall portions defining an open-ended vertical passage and said stabilizer element being dimensioned to fit in said passage for vertical sliding movement relative to said mounting means while being restrained by said wall portions against horizontal movement in any direction relative to said mounting means;

(e) said stabilizer element having a vertically elongated transverse opening above said U-shaped extremity, said transverse opening having upper and lower edges; and

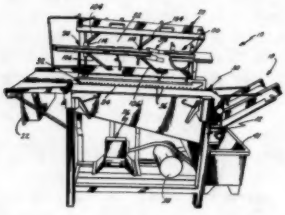
(f) one of said wall portions of said mounting means bearing a stop projection, of lesser vertical extent than said transverse opening, disposed within said transverse opening for limiting the extent of upward and downward movement of the stabilizer element by interfering engagement of the stop projection with said lower and upper edges of said transverse opening.

4,639,971
DOOR HINGE SHIM
Thomas D. Kurtz, 1101 First Ave., Rock Falls, Ill. 61071
Filed Oct. 23, 1981, Ser. No. 314,100
Int. Cl.[4] E05D 7/04
U.S. Cl. 16—247 5 Claims



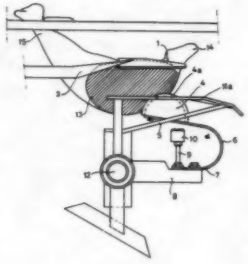
1. A door hinge shim for use with hinge mounted doors to adjust the hinge mounting of a door on a door casing, the hinge mounting including first and second members interconnected by a set of threaded fasteners, the shim comprising a generally rectangular shim plate having a plurality of slots opening at a first edge at locations to receive the shanks of the set of fasteners when the fasteners are loosened and the shim plate is inserted between the first and second members, and a shim installing handle integral with a second edge of the shim plate opposite said first edge and extending outwardly from the shim plate, the shim installing handle having a line of weakness formed therein at its juncture with said second edge of the shim plate to facilitate breaking of the shim installing handle off the shim plate after installation of the shim, at least one of the slots in the shim plate having teeth on opposite side edges extending toward each other with the apices of the teeth spaced apart a distance slightly less than the diameter of the shanks of the threaded fasteners to releasably engage the shank of a fastener and hold the shim plate in a selected position.

4,639,972
THIGH DEBONER
Eugene G. Martin, New Holland, and Dale M. Risser, Denver, both of Pa., assignors to Favorite Manufacturing, Inc., New Holland, Pa.
Filed Jun. 24, 1985, Ser. No. 747,844
Int. Cl.[4] A22C 17/04, 21/00
U.S. Cl. 17—11 38 Claims



1. A deboner apparatus for removing meat from an elongated poultry bone of a poultry part, said apparatus comprising:
an elongated frame defining an infeed end and a discharge end;
an elongated conveyor supported on said frame and extending from said infeed end to said discharge end, said conveyor including means for engaging the poultry part;
a hold-down means supported above said conveyor for holding said bone in engagement with said conveyor;
a scraper positioned above said conveyor;
means connected to said scraper for biasing said scraper into engagement with the meat on the bone and for controlling the force exerted by said scraper on the meat;
water knife means supported on said frame above said conveyor for discharging a high pressure water stream onto the meat to peel the meat down from the bone; and
a cutting assembly on said frame and positioned downstream of and below said hold-down means and said water knife means for cutting the meat from a lower edge of the bone.

4,639,973
DEVICE FOR CUTTING OFF THE TAIL OF SLAUGHTERED POULTRY
Henricus F. J. M. van der Eerden, Boxtel, Netherlands, assignor to Stork PMT B.V., Boxmeer, Netherlands
Filed Apr. 8, 1985, Ser. No. 720,672
Claims priority, application Netherlands, Apr. 9, 1984, 8401122
Int. Cl.[4] A22C 21/00
U.S. Cl. 17—11 4 Claims

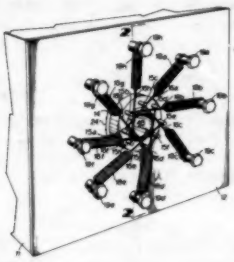


1. A device for severing the tail of slaughtered poultry while a carcass is suspended by its legs from a conveyor track and being transported breast side forward along the track comprising:
a cutting knife situated to pass between the two suspended legs of the carcass as it moves forward on the conveyor track;
an upper guide means attached to the cutting knife for maintaining the back bone side of the carcass in approximate alignment with the cutting knife;
a lower guide means having two elongate spaced apart plates wherein one plate is situated under each side of the carcass; and
a spring-mounted pressure member located between the two plates for biasing the carcass upwardly to bring the tail to be cut in alignment with the cutting knife.

4,639,974
THIGH DEBONER
Harold D. Olson, Smyrna, Ga., assignor to Cagle's Inc., Atlanta, Ga.
Filed Jul. 2, 1985, Ser. No. 751,076
Int. Cl.[4] A22C 17/04
U.S. Cl. 17—46 10 Claims

3. A method of removing meat from an elongated bone of a poultry part or the like comprising the steps of: positioning one end portion of the poultry part in a central portion of a polygon formed by a plurality of wires, applying yieldable spring tension to one end of each wire, moving one end of each wire

in a path to reduce the size of the polygon until the wires engage the poultry part and bend about the poultry part, and



cutting with at least some of the wires through the meat until the wires reach the bone.

4,639,975

DEVICE FOR SEPARATING THE LEGS FROM A CARCASS PORTION OF SLAUGHTERED POULTRY

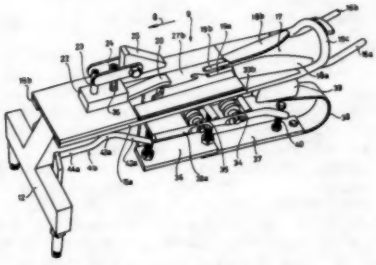
Henricus F. J. M. van der Eerden, Boxtel, Netherlands, assignor to Stork PMT B.V., Boxmeer, Netherlands

Filed May 28, 1985, Ser. No. 738,232

Claims priority, application Netherlands, May 29, 1984, 8401720

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—11 **5 Claims**



1. A device for separating a poultry back from a carcass portion suspended by its legs from a moving conveyor track by cutting between the back and thighs so that the oysters remain attached to the upper thighs comprising:

a leg guide located below the conveyor track and positioned to pass between the suspended legs of the carcass as it is moved in a forward direction, the guide having two elongate spaced-apart guide edges situated in an essentially parallel relationship to the track, one guide edge being positioned on each side of the track, the guide edges extending downwardly and outwardly to press against the upper inner thighs of the carcass portion as it is transported by conveyor;

two elongate downwardly extending cutting knives attached to the guide edges, each having at least two hook-shaped cutting edges pointed against the direction of transport and positioned to sever the thighs and oysters from the back as the carcass portion is moved forward; and

a carcass portion support means positioned below the leg guide.

4,639,976

METHOD AND A SYSTEM FOR PEELING CRUSTACEANS

Otto D. Hansen, Ostre Skovvej 21, DK-8240 Risskov, and Bent K. Nielsen, Falkevej 45, DK-9352 Dybvad, both of Denmark

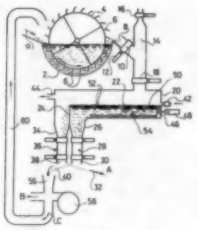
PCT No. PCT/DK82/00112, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02049, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 16, 1982, Ser. No. 527,577

Claims priority, application Denmark, Dec. 17, 1981, 5599/81

Int. Cl.[4] A22C *29/02*

U.S. Cl. 17—48 **9 Claims**



1. A method for removing shells from crustaceans, the method comprising the steps of subjecting the crustaceans to a pressure difference treatment for loosening the shells from body portions of the crustaceans and to a mechanical treatment for effectively separating the loosened shells from the body portions of the crustaceans, wherein the step of subjecting the crustaceans to a pressure difference includes exposing the crustaceans to a pressure drop from a pressure level, at which a body liquid adjacent a surface of the body portions and ajust inside the shells exists in a liquid phase, to a lower pressure level, which is low enough to cause a boiling of said body liquid just inside the shells, and rapidly moving the crustaceans for the mechanical treatment against or into a brake liquid serving to frictionally engage the outside of the crustaceans thereby peeling or drawing-off the already loosened shells thereof, and heating the crustaceans from the outside imemdiately prior to said pressure drop for a short duration such that the temperature of the body liquid just inside the shell is higher than a temperature of the body portion when the crustacean is subjected to said pressure drop.

4,639,977

COMBINATION ROPE GUARD AND ROPE BUNDLE KEEPER

William R. Howard, Rte. 2, Box 193 N, Brentwood, Calif. 94513

Filed Feb. 27, 1986, Ser. No. 834,163

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 R **5 Claims**

1. A combination rope bundle keeper and rope guard, the rope guard for protecting an item being held in place by the rope from the rope pressing against the item at a position on the item where the rope changes direction due to a change in shape of the item, the combination comprising:

an elongate, flat, flexible body member of a protective material, the body member including first and second lateral edges, a top surface, a bottom surface, a first end, a second end, a length and a width;

a first slit, positioned at the first end, extending from the first lateral edge toward the second lateral edge in a first direction transverse to the length;

a second slit, positioned at the second end a chosen distance from the first slit, extending from the second lateral edge

toward the first lateral edge in a second direction transverse to the length;

the body member manipulable between an extended rope guard orientation and a generally ring-like rope bundle keeper orientation with the first and second ends engaged at the first and second slits;

the first and second slits sized for receipt of the rope with the rope passing through the first and second slits and lying

adjacent a portion of the upper surface between the slits, the lower surface of the rope guard positioned against the item at the item position so the body member protects the item from the direct contact of the rope when the body member is in the rope guard orientation; and

the chosen distance chosen so when the body member is in the rope bundle keeper orientation the body member circumscribes and snugly surrounds the rope bundle.

4,639,978

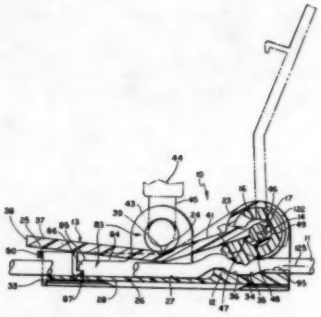
CORD LOCK DEVICE

Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91001

Filed Dec. 21, 1984, Ser. No. 684,676

Int. Cl.[4] F16G *11/00*

U.S. Cl. 24—134 R **33 Claims**



1. A device comprising:

a body past which two elongated flexible elements can extend;

an actuating member mounted to said body for relative swinging movement essentially about an axis between a locking position and a released position; and

two locking members for engaging said two elongated flexible elements respectively and retaining them against longitudinal movement in a predetermined direction and which are connected to said actuating member for swinging movement therewith between said positions;

each of said locking members having a gripping portion which in said locking position of the actuating member is positioned to clamp a corresponding one of said elongated elements against said body, and which in said released position of the actuating member releases said corresponding element for longitudinal movement in said direction;

means mounting each of said locking members for limited pivotal movement about said axis relative to said actuating member and relative to the other of said locking members when the actuating member is in said locking position thereof;

said gripping portion of each of said locking members being constructed to grip the corresponding one of said elongated flexible elements progressively more tightly as that locking member pivots relative to the actuating members and relative to the other of said locking members when the actuating member is in said locking position.

4,639,979

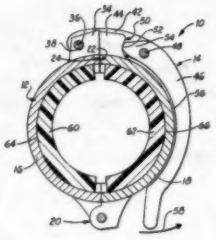
BARBELL COLLAR

Gary R. Polson, Stillwater, Okla., assignor to Strength, Tech, Inc., Stillwater, Okla.

Division of Ser. No. 615,375, May 30, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,354

Int. Cl.[4] F16L *23/00*

U.S. Cl. 24—270 **5 Claims**



1. A collar for securing weights on the bar having opposite ends of a barbell, comprising:

a pad support ring comprising two arcuate sections hinged together at one side of the pad support ring so that the pad support ring can be opened and closed about said bar, each of the sections of the pad support ring terminating in a free end across the pad support ring from the hinged connection of the two sections of the pad support ring;

at least one pad disposed on the inside of each of the sections of the pad support ring to grippingly engage said bar when the pad support ring is closed about said bar, a groove being formed in the inside periphery of each section of the pad supporting ring with each groove being adapted to receive the pad disposed in that section, each pad having opposite ends;

securing means for securing the pads within the grooves of the sections of the pad support ring to prevent movement of the pads between the free end of each section and the hinged connection of the sections, the opposed ends of the pad in one section being spaced from the opposed ends of the pad in the other section when the pad support ring is closed about the bar; and

linkage means having one portion movably connected to the free end of one of the sections of the pad support ring and another portion removably connectable to the free end of the other pad support ring for removably securing the pad support ring in the closed condition when said means is removably connected to the free end of said other section of the pad support ring, the pad support ring being positionable about the bar by moving the pad support ring over the bar at a position spaced a distance from one end of the bar with the bar being moved through the space between the free ends of the sections of the pad support ring in the opened position of the pad support ring to a position wherein the bar is disposed between the sections of the pad support ring, and said means being movable to

a closed position wherein said means is removably connected to the free end portion of one of the sections of the pad support ring for removably locking the sections of the pad support ring in the closed position with the pads grippingly engaging the bar substantially to prevent axial movement of the pad support ring on the bar and substantially to secure the pad support ring to the bar.

4,639,980

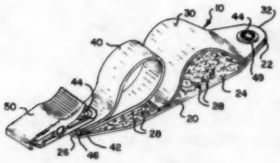
TUBING ORGANIZER

Drew Peterson, Golita, Calif., assignor to Hall Surgical, Division of Zimmer, Inc., Carpinteria, Calif.

Filed May 25, 1984, Ser. No. 614,032

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—306 **4 Claims**



1. In an improved tubing organizing device of the type including a first strap having one surface of fine densely matted fibers, a second strap secured at one end to the first strap and having a surface which opposes the matted surface of the first strap, the opposing surface of the second strap having a plurality of generally rigid barbed extensions which adhere to the matted fibers of the surface of the first strap when the opposing surfaces are pressed together, and a clip attached to the first strap for fastening the device to an object, wherein the improvement comprises:

a third strap folded over on itself and secured to said first strap such that a closed loop is formed;

said loop being disposed between one end of said first strap and said clip, and said clip, loop and first strap being held together at a first point by a first eyelet;

said second strap being secured to the opposite end of said first strap by a second eyelet; and

said loop being secured to said first strap at a second point by a third eyelet to maintain the alignment of said loop along said first strap;

wherein the materials which make up the device are capable of withstanding exposure to temperatures up to two hundred eighty degrees Fahrenheit.

4,639,981

SLIDE FASTENER STRINGER HAVING CONTINUOUS THERMO-PLASTIC MOLDED COUPLING ELEMENT STRIP

Hiroshi Yoshida, and Akira Hasegawa, both of Kurobe, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 472,626, Mar. 7, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,972

Claims priority, application Japan, Mar. 8, 1982, 57-3216[U]

Int. Cl.[4] A44B *19/10*

U.S. Cl. 24—401 **2 Claims**

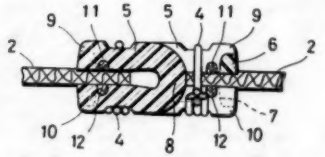
1. A slide fastener stringer comprising:

(a) a stringer tape;

(b) a continuous zigzag-shaped thermoplastic molded coupling element strip attached to said stringer tape by a sewn thread extending along the length of said strip and disposed on and along one longitudinal edge thereof, said strip including

(1) a succession of laterally spaced coupling elements, each having a head and a pair of first and second legs extending from said head in a common direction and respectively terminating in a distal end heel, and

(2) a plurality of first and second individually spaced solid connecting portions alternately disposed at opposite sides of said strip and extending one between each adjacent pair of said coupling elenents, each of said first connecting portions interconnecting said heels of an adjacent pair of said first legs, each of said second connecting portions interconnecting said heels of an adjacent pair of said second legs, said connecting portions being engageable with a slider and being disposed at the tape-engaging sides of said heels, said connecting portions having a reduced size between said coupling elements remote from said stringer



tape to thereby provide flexibility in each connecting portion between said adjacent pair of said coupling elements; and

(c) a pair of connector threads extending transversely of said coupling elements through the full length of said strip and embedded only in said first and second legs, respectively, of each said coupling element, each of said connector threads being respectively disposed between said sewn thread and said connecting portions close to and extending along the head side of a respective one of such two series of said first and second connecting portions, each said connector thread being aligned with the respective series of said connecting portions in a plane parallel to the general plane of said stringer tape.

4,639,982

RELEASABLE BUCKLE

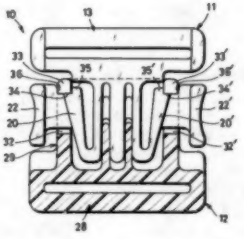
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 478,168, Mar. 23, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 728,149

Claims priority, application Japan, Mar. 23, 1982, 57-40577[U]; Oct. 9, 1982, 57-153791[U]

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—616 **3 Claims**



1. A buckle for fastening ends of a flat belt-like article, comprising:

A. A male member molded of synthetic resin as one piece including

(1) a first belt-end retainer portion adapted to be connected to one end of the flat belt-like article, and

(2) a plug portion having

(a) a generally T-shaped stem having a horizontal portion integral with said first retainer portion, and a

vertical portion perpendicular thereto, said vertical portion of said stem further having a pair of guide recesses extending from the distal end of said vertical portion toward said horizontal portion and terminating substantially midway along its length;

(b) a pair of resilient upturns extending from opposite corners of the distal end of said stem, each of said upturns having a lug projecting upwardly at its distal end so as to define with the later a locking recess at the outer side of said lug;

(c) a pair of thinner connecting portions each extending outwardly from an outwardly facing side of the respective upturn and terminating in an enlarged gripping ear; and

B. A female member molded of synthetic resin as one piece including

(1) a second belt-end retainer portion adapted to be connected to the other end of the flat belt-like article; and

(2) a socket portion having

(a) means defining a socket-opening at one end of said socket portion receptive of said plug portion and also defining a pair of side slits communicating with said socket-opening, said means having a pair of first and second inner walls, said means of said socket portion further having a pair of guide projections extending between said inner walls, said guide projections extending from the bottom of said socket opening toward the open end of said socket opening and terminating substantially midway between said bottom and said open end, each of said guide projections being receivable in a respective one of said guide recesses in said vertical portion of said stem when said plug portion is received in said socket opening; and

(b) two pairs of inwardly facing flanges disposed one pair at each side of said socket-opening, each said pair of flanges defining therebetween a restricted slit communicating with both said socket-opening and one of said side slits for passage therethrough of a respective one of said connecting portions, each said restricted slit having a width greater than the thickness of each said connecting portion and smaller than the thickness of either of said lug and said upturn so that each pair of said flanges is received in one of said locking recesses, each said flange having a first abutment facing one of said side slits for engagement with said distal end of one of said upturns to restrict the movement of said male and female members away from each other, and a second abutment facing said socket-opening for engagement with said lug of one of said upturns to restrict the outward movement of said distal end and hence to prevent said respective upturn from being overbent outwardly.

4,639,983

HOOK FOR A HOOK-AND-EYE FASTENER

Takeo Fukuroi, and Keichi Inazawa, both of Uozu, Japan, assignors to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 747,958

Claims priority, application Japan, Jul. 6, 1984, 59-102169

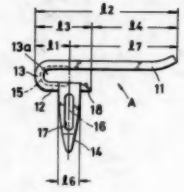
Int. Cl.[4] A44B *1/42*

U.S. Cl. 24—689 **6 Claims**

1. A hook for a hook-and-eye fastener, comprising:

(a) a one-piece hook body including a base, a locking tongue lying substantially parallel to said base, an intermediate arcuate portion extending between said base and said locking tongue so as to define therebetween an eye-receiving channel, said locking tongue projecting beyond the free end of said base by a distance which is one and a half to two times as large as a distance between the vertex of said arcuate portion and the free end of said base, said base having a pair of prongs projecting substantially perpendicularly therefrom in a direction away from said locking tongue, said prongs being located on opposite edges of said base such that the longitudinal central axes of said prongs extend in a plane which is spaced from the vertex of said arcuate portion by a distance approximately equal to one-fourth of the entire length of said hook body;

(b) said hook body having an inner surface facing said eye-receiving channel, and a plurality of cold-pressed elongated recesses defined in said inner surface and extending from said base through said arcuate portion to said locking tongue, each said recess having opposite end portions terminating adjacent to a plane in which the longitudinal



central axes of said prongs extend, a region adjacent said recesses having a cold-pressed modulus large enough to afford increased resiliency and strength to said arcuate portion; and

(c) a retainer having a pair of openings through which said prongs can extend, respectively, said openings being spaced from one another by a distance which is smaller than the distance between said pair of prongs, each said prong having a bent end portion retained on said retainer with a space defined therebetween.

4,639,984

GUIDE TRACK FOR A TENTERING CHAIN

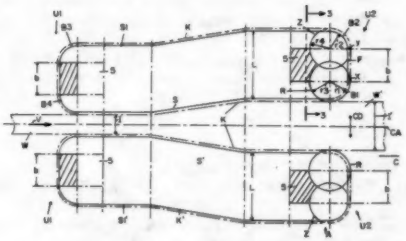
Rudolf Langer, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,403

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443905

Int. Cl.[4] D06C *3/02*

U.S. Cl. 26—89 **19 Claims**



1. A guide track for a tentering chain carrying a plurality of tentering members supported by rollers on the guide track, comprising a plurality of guide rail sections forming a forward run, a reverse run, and intermediate runs forming U-turns interconnecting said forward and reverse runs for forming an endless guide track, drive sprocket means operatively arranged in one of said U-turns between said forward and reverse runs for meshing with said tentering chain, said one U-turn in which said drive sprocket means are located comprising a straight guide rail section having a given length and two curved guide rail sections each having a given radius of curvature, said straight guide rail section being arranged between said two curved guide rail sections, said drive sprocket means being

arranged coaxially with one of said curved guide rail sections, both of said radii of curvature of said two curved guide rail sections being equal to each other and each of said radii of curvature being smaller than one half of a spacing between said forward and reverse runs of said guide track, wherein each of said two curved guide rail sections forms a 90° looping angle, said both curved guide rail sections together form a complete 180° U-turn.

10. A guide track for a tentering chain carrying a plurality of tentering members supported by rollers on the guide track, comprising a plurality of guide rail sections forming a forward run, a reverse run, and intermediate runs forming U-turns interconnecting said forward and reverse runs for forming an endless guide track, drive sprocket means operatively arranged in one of said U-turns between said forward and reverse runs for meshing with said tentering chain, said one U-turn in which said drive sprocket means are located comprising a straight guide rail section and two curved guide rail sections each having a given radius of curvature, means for mounting said two curved guide rail sections at different spacings from each other, said straight guide rail section being arranged between said two curved guide rail sections, said drive sprocket means being arranged coaxially with one of said curved guide rail sections, each of said radii of curvature being smaller than one half of a spacing between said forward and reverse runs of said guide track, said straight guide rail section having a given length between said two curved guide rail sections corresponding to one of said different spacings, whereby said straight guide rail section is exchangeable by a similar straight guide rail section having a different length for varying the length of the respective U-turn, and wherein said different spacings relate to said different lengths of said straight guide rail sections.

4,639,985

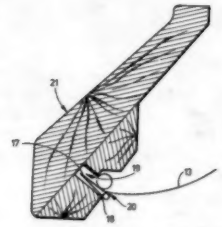
SNAP-IN CASKET DISH

William K. Craft, Cincinnati, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Jun. 19, 1984, Ser. No. 622,303

Int. Cl.[4] A61G *17/00*; E04F *19/02*

U.S. Cl. 27—19 **6 Claims**



1. An improved burial casket comprising:

(A) A main casket body;

(B) A casket lid removably attached to said casket body and having a casket lid channel formed in the interior rim thereof;

(C) A mounting channel member inserted in said casket lid channel and generally conforming to said casket lid channel, said mounting channel member having a pair of opposed edges, one of said opposed edges being adjacent to one outer edge of said casket lid channel and comprising a generally rigid, decorative stop member, said other opposed edge comprising a spring member thereof and adjacent to another outer edge of said casket lid channel and

(D) A flexible casket dish configured to generally conform to the interior of said casket lid and having extending portions removably secured in said mounting channel member having free end, in said casket lid channel, said extending portions comprising a creased flap member the free end of which abuts said stop member and is held in place thereby, said flap member being secured in said mounting channel member and held in position against said generally rigid stop member by the action of said spring member whereby said casket lid channel and said creased flap member of said dish are hidden from view by said decorative stop member.

4,639,986

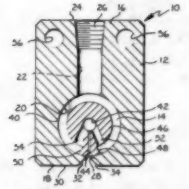
FILAMENT JET ENTANGLER

Borenstein, David E., Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 1, 1981, Ser. No. 249,802

Int. Cl.[4] D02G *1/16*; D02J *1/08*

U.S. Cl. 28—272 **59 Claims**



1. A filament entangler comprising:

a jet body;

a yarn confining passage extending entirely through said jet body;

a pair of fluid jet ports in said jet body disposed adjacent to and on opposite sides of said yarn confining passage, said ports communicating in fluid flow relation with said passage, said ports further each having a longitudinal axis, said longitudinal axes lying in a common plane intersecting the axis of said generally cylindrical yarn confining passage and defining an included angle of about 48° therebetween; and

fluid passage means communicating with said pair of fluid jet ports for conducting fluid from a source thereof to said fluid jet ports whereby said fluid is directed through said fluid jet ports into said yarn confining passage.

4,639,987

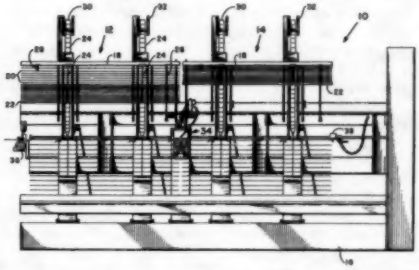
APPARATUS FOR PRODUCING SIMULTANEOUSLY A PLURALITY OF VENETIAN BLINDS

George Georgopoulos, Pine Brook, N.J., assignor to Levolor Lorentzen, Inc., Parsippany, N.J.

Filed Apr. 19, 1985, Ser. No. 725,020

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—24.5 **3 Claims**



1. A method of producing a plurality of venetian blinds simultaneously, comprising the steps of:

(a) setting up a plurality of blind producing stations adjacent

to each other; each station supporting a venetian blind head rail, a venetian blind bottom rail below said head rail, and a plurality of spaced venetian blind ladders parallel to each other and spaced over the width of the respective station; the head rail, bottom rail, and blind ladders of one station being separate from the head rail, bottom rail and blind ladders respectively of another station;

(b) cutting from a continuous supply of slat material a length corresponding essentially to the width of the plurality of stations; and simultaneously punching into said length of material openings at locations corresponding to the ladders in the finished plurality of blinds;

(c) feeding the cut length of slat material into the blind stations, through the ladders of the blinds, until the slat material engages a stop adjacent the last of said plurality of stations as seen from said supply;

(d) cutting the slat material between adjacent ones of said plurality of stations; and

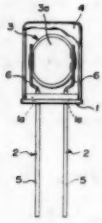
(e) repeating steps (b), (c) and (d) until a desired vertical length of blind between said head and bottom rails has been produced.

4,639,988

METHOD OF MAKING QUARTZ OSCILLATORS

Hajime Goto; Ikuzo Amemiya; Masanobu Nakayama, all of Yokohama, and Yoshinobu Hatano, Ebina, all of Japan, assignors to Kanagawa Mfg., Co., Ltd., Yokohama, Japan

Filed Jul. 13, 1984, Ser. No. 630,850
Int. Cl.[4] H04R *17/00*
U.S. Cl. 29—25.35 **12 Claims**



1. A method of making quartz oscillators, wherein a pair of leads having a substantially circular cross-sectional shape and inner ends inserted respectively through a pair of holes in a base are glass-sealed to the base at the holes and have inner leads projecting respectively from the inner ends of the leads inserted through the base, and a quartz member having opposite side edges inserted through slots in the inner leads has a pair of electrode plates on opposite sides thereof electrically connected to the inner leads, comprising:

providing a base having a pair of spaced holes therethrough;

inserting a pair of elongated substantially circular cross-sectional shaped leads respectively through said holes so that portions thereof extend on opposite sides of the base to provide outer and inner spaced leads;

glass-sealing said leads in said holes to secure said leads to said base;

compressing said inner leads in dies to form hardened, resilient, flat plate-shaped inner leads extending in parallel spaced relationship with respect to each other;

bending the ends of the inner leads adjacent said base outwardly with respect to each other to displace said inner leads outwardly with respect to said holes while maintaining a substantial portion of said inner leads in said parallel spaced relationship;

punching elongated slots in said parallel portions of said inner leads by punching die means;

resiliently spreading apart said inner leads;

inserting a disk-shaped quartz element having electrode plates on opposite sides thereof between said inner leads so that the opposite side edges of said quartz element are juxtaposed with respect to said slots;

allowing said inner leads to resiliently return to said parallel position to insert the side edges of the quartz element through said slots into engaging relationship with said inner leads; and

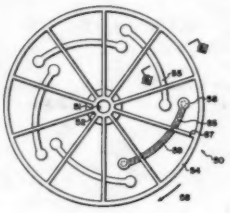
electrically connecting said inner leads with said electrode plates of the quartz element.

4,639,989

SANDING TOOL

Charles E. Filby, 73 Bank Ave., Winnipeg, Manitoba, Canada R2M 0N3

Filed Apr. 9, 1985, Ser. No. 721,442
Claims priority, application Canada, Oct. 2, 1984, 464565
Int. Cl.[4] B23D *71/00*
U.S. Cl. 29—79 **2 Claims**



1. Abrasive tool comprising a plurality of toothed strip portions, and integral continuous imperforate body member formed from a set plastics filler material in which said strip portions are rigidly embedded so that the filler material rigidly supports the strip portions along their full length, said body member being shaped to define an intended direction of working movement, said body member defining a support surface from which the teeth of the strip portions project for engaging and abrading a work surface generally parallel to the support surface, the strip portions being spaced from each other along their full length by a distance at least five times greater than the width thereof so as to sequentially engage the work surface as the support surface moves relative thereto and so as to allow self-cleaning from between the strip portions of material removed from the work surface by the strip portions, each said strip member being curved along its length in a curvature different from the intended direction of movement of the body member such it is prevented from moving in a working stroke of said body member directly along its length, said support surface having side edges which project sidewardly from outermost portions of the toothed strip portions so as to define shoulders, the extent of projection of the outermost portions from the surface being less than the width of the shoulder whereby to inhibit gouging of the work surface by the outermost toothed strip portions, the extent of projection of the toothed strip portions from said surface being less than ½ inch.

4,639,990

ROLL FOR TREATING WEBS, PREFERABLY WEBS OF PAPER

Christian Schiel, and Albrecht Bauder, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

PCT No. PCT/EP84/00376, § 371 Date Jul. 29, 1985, § 102(e) Date Jul. 29, 1985, PCT Pub. No. WO85/02425, PCT Pub. Date Jun. 6, 1985

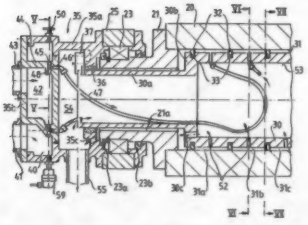
PCT Filed Nov. 29, 1984, Ser. No. 762,154

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343313

Int. Cl.[4] B21B *13/02;* B30B *3/00*

U.S. Cl. 29—116 R

25 Claims



1. Roll for treating webs, comprising:

a tubular roll shell rotatable about an axial axis and having an interior surface, means for supporting the shell at the axial ends thereof, and a means for rotating the shell;

a stationary core extending through the shell and having an exterior surface which faces the interior surface of the shell and means for supporting the core at its axial ends, the exterior diameter of the core being smaller than the interior diameter of the shell to define an annular space therebetween, which annular space has a radial thickness which changes in response to variations in the relative positions of the shell and the core;

at least one peripheral seal, in the shape of a closed ring, located on and extending circumferentially around the core, the at least one seal dividing the annular space between the shell and the core into a plurality of annular chambers, the at least one seal having a contacting surface in sliding contact with the interior surface of the shell, the sliding contact making a non-pressure tight seal with the interior surface of the shell thereby to reduce frictional heat and wear normally occurring at the contacting surface of the peripheral seal;

means for enabling the at least one seal to move into the surface of at least one of the shell and the core to accommodate variations in the radial thickness of the annular space whereby forces exerted on the seal by the shell or by the core will not be applied by the seal, respectively, to the core or to the shell; and

a respective fluid supply line and a respective fluid return line coupled to each of the annular chambers for, respectively, supplying to and withdrawing from the annular chambers a temperature regulating fluid at about atmospheric pressure, whereby a local external diameter of the roll is controlled by regulating the temperature of the fluid in each annular chamber.

4,639,991

PROCESS FOR PRODUCING A NEW EDGE ON AN AIRFOIL BLADE PARTICULARLY THE FAN BLADE FOR A GAS TURBINE ENGINE

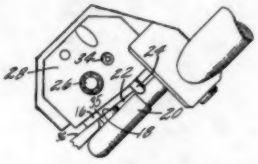
Harold M. Sharon, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 558,135, Dec. 5, 1983, Pat. No. 4,550,497, which is a continuation-in-part of Ser. No. 322,097, Nov. 16, 1981, abandoned. This application May 20, 1985, Ser. No. 736,020

Int. Cl.[4] B21K *3/04;* B23P *15/02, 6/00*

U.S. Cl. 29—156.8 B

4 Claims



1. A process for forming a thinner leading edge on a fan blade comprising the steps of:

(a) providing a first cutting means and a second cutting means;

(b) providing a fan blade having a first side surface and a second side surface, said surfaces meeting to define a leading edge; and,

(c) during a first cutting operation, forming a first cut surface using the first cutting means to produce a desired angle and fan blade thickness, by removing material from a portion of the first side surface adjacent the leading edge; and then,

(d) during a second cutting operation, simultaneously forming second cut surfaces using the second cutting means to produce an aerodynamically efficient contour by removing material at the leading edge from both the first cut surface and the second side surface, by guiding the second cutting means along the leading edge and engaging both a portion of the first cut surface and a portion of the second side surface.

4,639,992

CORROSION RESISTANT STEAM GENERATOR AND METHOD OF MAKING SAME

Israel Stol, Mount Lebanon, and Robert H. Appleman, Pleasant Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 563,899, Dec. 21, 1983, Pat. No. 4,579,087. This application Sep. 23, 1985, Ser. No. 778,950

Int. Cl.[4] B21D *53/00;* B23P *15/26*

U.S. Cl. 29—157 R

17 Claims

1. A method of fabricating a steam generator comprising the steps of:

providing inlet and outlet chambers and a secondary coolant chamber and at least one primary coolant tube passing through the secondary coolant chamber and connecting the inlet chamber to the outlet chamber;

positioning a tubesheet between one of said inlet or outlet chambers and the said secondary chamber, said tubesheet having at least one passage therethrough;

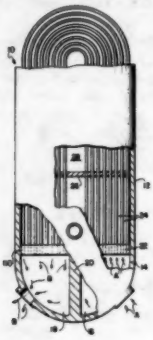
upsetting ends of said primary coolant tube to form a transition region in said ends, said transition region having smoothly varying wall thickness;

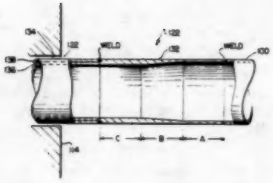
reducing the outside diameter of a portion of said upset ends to accept a sleeve;

installing said sleeve on said outside diameter portion;

closing any space between said sleeve and said reduced outside diameter portion along an interface therebetween;

welding said sleeve to said primary coolant tube to form a sleeve and tube assembly;





inserting said sleeve and tube assembly into said passage in said tubesheet; and

welding the sleeve and tube assembly to the tubesheet.

4,639,993

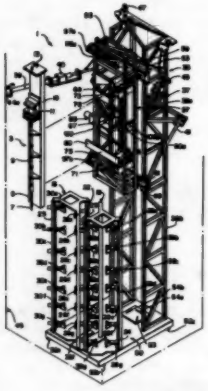
NUCLEAR FUEL ROD LOADING FIXTURE FOR USE IN A REMOTE REPAIR SYSTEM

Anoop Kapoor, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 20, 1985, Ser. No. 746,891

Int. Cl.[4] B23P *19/00, 11/00;* **G21C** *19/00*

U.S. Cl. 29—400 N **18 Claims**



1. An apparatus for facilitating the insertion of a fuel rod through a selected one of the rod-receiving apertures in a grid of a fuel rod assembly, comprising means for obstructing at least one of the rod-receiving apertures adjacent the selected aperture.

16. A method for facilitating the insertion of a fuel rod through a selected one of the rod-receiving apertures in a grid of a fuel rod assembly, comprising the step of obstructing at least one of the rod-receiving apertures su.rounding the selected aperture while extending said rod through said selected aperture.

4,639,994

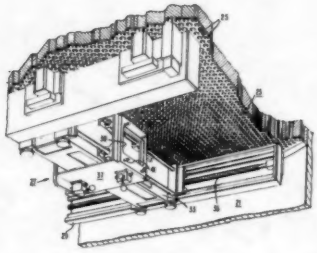
SUSPENSION OF TOOLS FOR SLEEVING OF TUBES OF STEAM GENERATOR

Frank W. Cooper, Jr., Monroeville, Pa.; Bruce A. Howard, Seminole, Fla., and David A. Snyder, North Huntingdon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1983, Ser. No. 538,309

Int. Cl.[4] B23P *7/00, 15/26*

U.S. Cl. 29—402.01 **3 Claims**



1. The method of suspending a tool, which serves to process the damaged tubes of a steam generator of a nuclear-reactor plant, either to prepare said tubes for insertion of a sleeve blank or to insert a sleeve blank, or to treat a sleeve after it is inserted in a tube, the said tube extending into the tube sheet of said steam generator, the said tool having a plurality of locking pins for engaging tubes of said generator adjacent to a damaged tube to be processed, the said method being practiced with apparatus including means, connected to said locking pins, for supplying fluid under pressure to insert and hold said locking pins, the said method comprising, supplying said fluid to said inserting means at a low pressure to insert said locking pins into said adjacent tubes at a low velocity, to seat said locking pins in said adjacent tubes properly, and, once said locking pins are seated in said adjacent tubes, increasing the pressure of said fluid to a high magnitude so that said locking pins are held firmly in said adjacent tubes, resisting removal by the reactive force of the processing.

4,639,995

METHOD OF RETAINING AND REPAIRING A TRACK JOINT

James A. Garman, Eureka, and Stephen D. Swift, Sparland, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 476,909, Mar. 18, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 713,361

Int. Cl.[4] B23P *7/00, 19/00;* **B21D** *1/00, 39/00*

U.S. Cl. 29—402.08 **13 Claims**

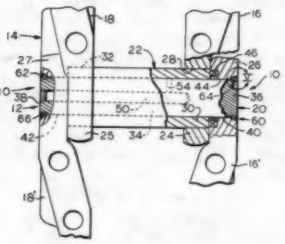
1. A method of repairing a joint of an endless track of a crawler type vehicle, said joint having at least one cavity and a formed-in-place retainer in said cavity, said cavity being defined by a groove in an end portion of a pin and a cooperating socket in a link end portion surrounding said pin end portion and having an opening at an outer side of said link end portion, comprising the steps of:

pushing said pin out of said link end portion and shearing said formed-in-place retainer;

removing the said sheared retainer from said joint;

replacing said pin end portion into said link end portion;

positioning an annular metal preform adjacent said cavity opening; and



applying an axial force to the preform sufficient to intrusively deform said preform and to premanently transform the preform into a new formed-in-place retainer.

4,639,996

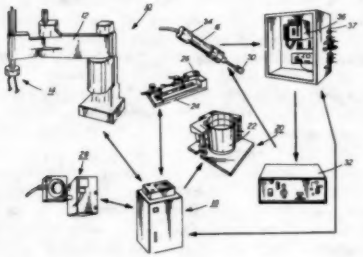
SCREW FASTENING METHOD

David M. Fullmer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 12, 1985, Ser. No. 754,097

Int. Cl.[4] B23Q *17/00;* **B25B** *23/151*

U.S. Cl. 29—407 **6 Claims**



1. A method of automatically attaching a threaded fastener to an article, including the steps of:

holding releasably the threaded fastener adjacent an untapped hole in the article;

applying a torque on the threaded fastener;

generating a signal indicative of the torque being applied on the threaded fastener; and

controlling the torque applied on the threaded fastener in response to the signal indicative of the torque applied on the threaded fastener so that the torque applied on the threaded fastener does not exceed a first pre-determined level as the threaded fastener taps threads in the hole in the article and a second pre-determined level after the threads have been tapped in the hole during the securing of the the threaded fastener to the article wherein said step of controlling includes the step of maintaining the first pre-determined torque level at a higher level than the second pre-determined torque level.

4,639,997

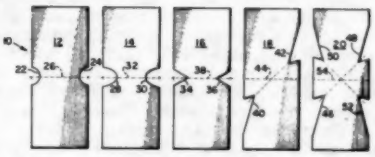
METHOD OF MAKING A DEVICE FOR MONITORING FATIGUE LIFE

Maurice A. Brull, Herzliya Pituach, Israel, assignor to Tensiodyne Scientific Corporation, Horsham, Pa.

Division of Ser. No. 573,081, Jan. 23, 1984, Pat. No. 4,590,804. This application Jul. 18, 1985, Ser. No. 756,419

Int. Cl.[4] B23Q *17/00*

U.S. Cl. 29—407 **5 Claims**



1. A method of making a device for monitoring the fatigue life of a member fabricated of a particular material comprising the steps of:

obtaining a thin sheet of the material from which the member is fabricated;

cutting a plurality of generally parallel elongated coupons from the thin sheet of material;

cutting a predetermined stress concentrating notch pattern comprised of at least one pair of notches into each coupon, one notch of the notch pair being disposed on each of the longitudinal sides of a coupon, the notches of the notch pair being substantially geometrically the same and substantially aligned with each other, the notch pattern of each of the coupons varying in intensity from mild in which the edge surfaces of the notches are generally smooth and continuously curved, to severe, in which the edge surface of each of the notches exhibits a sudden change to form two portions which are in different planes, the two portions meeting to form a line so that upon the application of the same strain to all of the coupons, each coupon has a different fatigue life, the fatigue life of each coupon being a percentage of the fatigue life of the member being monitored.

4,639,998

LOCKING TUBE REMOVAL AND REPLACEMENT TOOL AND METHOD IN A RECONSTITUTABLE FUEL ASSEMBLY

John M. Shallenberger, Fox Chapel, and Stephen J. Ferlan, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 9, 1984, Ser. No. 670,418

Int. Cl.[4] B23P *19/00, 17/00*

U.S. Cl. 29—426.5 **1 Claim**

1. For use with a reconstitutable fuel assembly including a top nozzle with an adapter plate having at least one passageway, at least one guide thimble with an upper end portion and an attaching structure having a hollow locking tube for releasably locking the upper end portion of the guide thimble within the passageway of the top nozzle adapter plate, a tool for removing the locking tube from its locking position, comprising:

(a) an elongated inner hollow tubular force-transmitting member having upper and lower opposite ends, said force-transmitting member being insertable at its lower end in said locking tube and including

(i) an elongated inner tubular body having upper and lower ends, and

(ii) a tubular extension having an upper end fixed to said lower end of said inner tubular body and extending therefrom in axial alignment therewith, an upper end portion of said tubular extension having a larger diame-

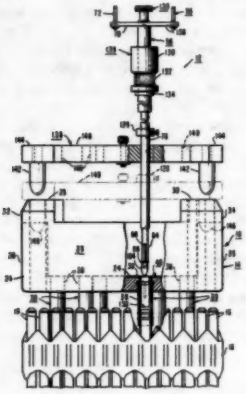
ter than a lower end portion thereof so as to define a downwardly-facing shoulder on said tubular extension which abuts said locking tube when said lower end of said force-transmitting member is inserted therein;

(b) a force-receiving member fixedly attached to said upper end of said force-transmitting member;

(c) locking tube-engaging means fixedly attached to said lower end of said force-transmitting member and being circumferentially expandable and collapsable, said locking tube-engaging means being defined on said lower end portion of said tubular extension which constitutes said lower end of said force-transmitting member, said locking tube-engaging means being in the form of an axially segmented sleeve which terminates in a lower segmented rim, said rim being expandable to a first outside diameter greater than an inside diameter of said locking tube and collapsable to a second outside diameter less than said inside diameter of said locking tube;

(d) an outer hollow tubular force-imparting member disposed about said inner force-transmitting member and slidably movable therealong in a reciprocating manner for delivering a sequence of forceful impacts against said force-receiving member, said force-imparting member including

(i) an upper enlarged cylindrical head, and



(ii) a lower hand grip tubular sleeve connected in tandem with said head such that upon reciprocable movement of said sleeve along said inner tubular member toward and away from said force-receiving member said head will deliver a series of forceful impacts in an upward axial direction to said force-receiving member, which impacts are transmitted via said inner tubular body and tubular extension to said segmented rim and thereby to said lower edge of said locking tube when said rim is in its engaged position whereby said locking tube is caused to incrementally move and to dislodge from its locking position;

(e) said force-receiving member being in the form of a bail assembly, said bail assembly including

(i) a generally flat plate fixed to said upper end of said inner tubular force-transmitting member and disposed for receiving said impacts of said head of said force-imparting member, and

(ii) a handle connected to and extending upwardly from said plate;

(f) an elongated shaft means extending through said force-transmitting member between the ends thereof and mounted for axial movement therealong, said shaft means having upper and lower opposite ends, said shaft means including

(i) a central shaft disposed in said inner tubular body of said force-transmitting member and having upper and lower ends, and

(ii) a shaft extension disposed in said tubular extension of said force-transmitting member and having upper and lower ends, said shaft extension being fixed at its upper end to said lower end of said central shaft;

(g) means attached to said upper end of said shaft means and being operable to cause axial movement of said shaft means between extended and retracted positions relative to said force-transmitting member, said operable means including

(i) an actuating knob threadably coupled to said upper end of said central shaft of said shaft means, and

(ii) means mounted to said upper end of said inner tubular body of said force-transmitting member and coupled to said central shaft such that rotation of said knob in a first sense causes nonrotational axial movement of said control shaft and said shaft extension of said shaft means in a first direction, to said retracted position, whereas rotation of said knob in a second opposite sense causes nonrotational axial movement of said central shaft and shaft extension of said shaft means in a second direction to said extended position; and

(h) means attached to said lower end of said shaft means and movable between disengaged and engaged positions relative to said locking tube-engaging means, the latter assuming a circumferentially-collapsed position when said shaft means is at one of its positions and said movable means is at its disengaged position and a circumferentially-expanded position when said shaft means is at the other of its positions and said movable means is at its engaged position such that repeated reciprocation of said force-imparting member will cause delivery of a sequence of impacts against said force-receiving member and via said force-transmitting member and tube-engaging means against a lower end of said locking tube so as to provide sufficient force to incrementally move said locking tube relative to said guide thimble from its locking position, said means attached to said lower end of said shaft means being in the form of a conical nose fixedly mounted to said lower end of said shaft extension of said shaft means and disposed below said segmented rim of said locking tube-engaging means such that movement of said shaft means to its retracted position moves said conical nose to its engaged position in which it is forcibly inserted into said segmented rim sufficiently to expand the same to its first outside diameter size wherein said segmented rim will engage said lower edge of said locking tube, whereas movement of said shaft means to its extended position moves said conical nose to its disengaged position in which it is withdrawn from said segmented rim sufficiently to allow contraction of the same to its second outside diameter size wherein said segmented rim will fit through said locking tube.

4,639,999

HIGH RESOLUTION, HIGH EFFICIENCY I.R. LED PRINTING ARRAY FABRICATION METHOD

Joseph J. Daniele, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1984, Ser. No. 667,706
Int. Cl.[4] H01L 7/36
U.S. Cl. 29—569 L **9 Claims**

1. A method of fabricating a high speed, high resolution IR LED array for printing images, comprising the steps of:

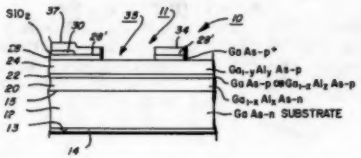
(a) metallizing one surface of a GaAs-n substrate to provide a common electrical contact for said LEDs;

(b) growing a first layer of GaAlAs-n on the other surface of said substrate;

(c) growing a second layer of GaAs-p or GaAlAs on said first layer;

(d) growing a third layer of GaAlAs-p on said second layer;

(e) growing an electrical contact layer of GaAs-p+ on said third layer;
(f) depositing an insulating layer on said electrical contact layer;
(g) etching both said insulating and said contact layers at selected points to expose predetermined areas of said third layer and form viewing windows defining each of said LEDs;



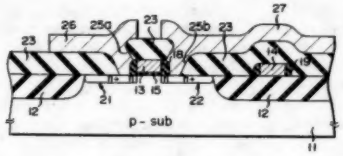
(h) etching said portion of said insulating layer in the area bounding each of said viewing windows to expose a portion of said contact layer; and
(i) metallizing said exposed portions of said contact layer to provide said individual electrical contacts for each of said LEDs.

4,640,000

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Masaki Sato, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 26, 1984, Ser. No. 686,375
Claims priority, application Japan, Dec. 27, 1983, 58-244562
Int. Cl.[4] H01L *21/443*
U.S. Cl. 29—571 **15 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:
forming an element isolation region in a surface of a semiconductor substrate of a first conductivity type to provide an island element region surrounded by said element isolation region;
forming a gate structure on a surface of said island element region, said gate structure including a gate insulating film and a gate electrode film formed thereon;
doping an impurity having a second conductivity type opposite to the first conductivity type by using said gate structure as a mask, thereby forming first and second semiconductor regions in the island element region;
forming a wall of an insulating material on a side wall of said gate structure;
depositing an insulating film on an entire surface of said semiconductor substrate which includes said element isolation region, said island element region and said gate structure including said wall;
selectively etching a portion of said insulating film which corresponds to a step portion formed by surfaces of said insulating wall and said island element region to form first and second contact holes so as to partially expose said first and second semiconductor regions therethrough; and
forming a wiring layer on the remaining insulating film so as to electrically connect to said first and second semiconductor regions through said first and second contact holes.

4,640,001

SOLAR CELL MANUFACTURING METHOD

Sakae Koiwai, Ohmihachiman; Keizo Asaoka; Katsuhiko Shirasawa, both of Yohkaichi; Hiroyuki Watanabe, Kusatsu, and Junichi Honda, Sakura, all of Japan, assignors to Japan Solar Energy Co., Ltd., Japan

Filed Dec. 20, 1984, Ser. No. 684,271
Int. Cl.[4] H01L *31/18*
U.S. Cl. 29—572 **1 Claim**

1. A method of manufacturing a solar cell composed of a polycrystalline silicon wafer with a silicon nitride film deposited thereon as an antireflection coating, said cell having an improved energy conversion efficiency, said method comprising the steps of:
depositing said silicon nitride film on said polycrystaline silicon wafer by a plasma CVD method, said polycrystaline silicon wafer being maintained at a temperature between 350° C. and 500° C.;
removing by an etching method portions of said silicon nitride film deposited in said depositing step, the portions to be removed corresponding to the areas where an electrode is to be formed; and
forming said electrode at said portions where said silicon nitride film is removed in said second process, whereby a solar cell having an energy conversion efficiency greater than 11.5% is produced.

4,640,002

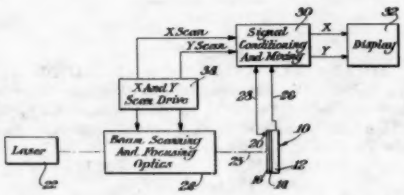
METHOD AND APPARATUS FOR INCREASING THE DURABILITY AND YIELD OF THIN FILM PHOTOVOLTAIC DEVICES

James E. Phillips, and Patrick G. Lasswell, both of Newark, Del., assignors to The University of Delaware, Newark, Del.

Continuation of Ser. No. 352,218, Feb. 25, 1982, abandoned. This application Dec. 5, 1985, Ser. No. 805,435
Int. Cl.[4] H01L *31/18*
U.S. Cl. 29—574 **17 Claims**

1. In a method of manufacturing thin film photovoltaic cells including the steps of depositing at leasat first and second thin film semiconductor layers on a substrate and forming electrical contacts to the semiconductor layers, the improvement being applying a reverse bias voltage between the semiconductor layers, laser scanning the cell to selectively locate localized shorting or shunting defects therein whereby material from one of the cell components on one side of one of the thin film

semiconductor layers would thereby contact a cell component on the other side of that semiconductor layer through the defect which would result in a short or shunt, and selectively thermally eliminating the defect to prevent such shorting.



4,640,003

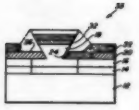
METHOD OF MAKING PLANAR GEOMETRY SCHOTTKY DIODE USING OBLIQUE EVAPORATION AND NORMAL INCIDENCE PROTON BOMBARDMENT

Nicolas A. Papanicolaou, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1985, Ser. No. 781,560

Int. Cl.[4] H01L *29/56, 21/283*

U.S. Cl. 29—576 B **7 Claims**



1. A method of fabricating a Schottky diode comprising the steps of:

providing a semi-insulating substrate of material selected from the group consisting of aluminum gallium arsenide, gallium arsenide and indium phosphide;

growing sequentially an n+ doped layer of the material, an n doped layer of the material, and an undoped layer of the material consecutively on the substrate;

depositing a polyimide on at least one region of the undoped layer;

masking at least one region on the undoped layer to produce at least one masked and one unmasked region;

etching away said unmasked region to produce a mesa with acute angled sides sloping inward from the top on the undoped layer so that the sides of the mesa define two recessed areas underneath the mesa;

depositing a Schottky material at an angle on the exposed n doped layer so that the recessed area on one side of the mesa is not covered with Schottky material;

depositing an ohmic material at an angle on the exposed n doped layer and on the Schottky material so that the recessed area on the other side of the mesa is not covered with ohmic material;

bombarding the Schottky material and ohmic material with protons at normal incidence so that the recessed areas are untouched; and

annealing the ohmic contact.

4,640,004

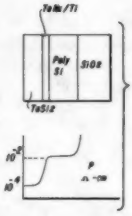
METHOD AND STRUCTURE FOR INHIBITING DOPANT OUT-DIFFUSION

Michael E. Thomas, Cupertino; Madhukar B. Vora, Los Gatos, and Ashok K. Kapoor, Palo Alto, all of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Apr. 13, 1984, Ser. No. 600,163

Int. Cl.[4] H01L *21/285*

U.S. Cl. 29—590 **29 Claims**



10. A method of inhibiting dopant diffusion in a high speed semiconductor device, said method comprising the steps of:

(a) providing a silicon substrate containing a dopant and having a first surface;

(b) disposing a first layer of a first refractory metal over the first surface of said substrate, said first layer having a predetermined thickness;

(c) depositing a second refractory metal on said first layer in an ambient environment having a predetermined concentration of nitrogen in order to form a blanket layer of a refractory metallic nitride having a predetermined thickness;

(d) placing an amorphous, co-deposited third refractory metal: silicon layer, having a predetermined thickness and a predetermined atomic ratio of silicon to refractory metal, on said blanket layer; and

(e) transforming said co-deposited layer to a refractory metallic dicilicide layer by heating at a predetermined temperature for a predetermined amount of time in a second predetermined ambient environment.

4,640,005

SUPERCONDUCTING MAGNET AND METHOD OF MANUFACTURE THEREOF

Susumu Mine, Zushi, and Takao Ishizaka, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 363,888, Mar. 31, 1982, Pat. No. 4,549,156. This application Jun. 12, 1984, Ser. No. 619,894

Claims priority, application Japan, Oct. 8, 1981, 56-160523; Dec. 4, 1981, 56-194430

Int. Cl.[4] H01L *39/24*

U.S. Cl. 29—599 **14 Claims**

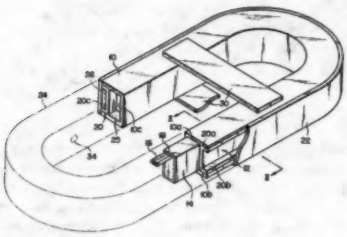
1. A method of manufacturing a superconducting magnet, comprising:

a first step of providing a winding former having a bottom wall connected to opposed side walls to define a rectangular groove extending in a race track fashion and having an open side;

a second step of tightly winding a superconducting wire a predetermined number of turns within said rectangular groove of said winding former, to prepare a coil structure

having a rectangular cross section conforming with the cross section of the bottom wall and at least a portion of the side walls of the groove;

a third step of hetmetically sealing the rectangular groove of the winding former filled with the coil structure within an annular space defined at least in part by said former to stably fix the coil structure so as to prevent generation of friction heat which causes the coil quench pheonmenon, i.e., change from the superconducting state to the normal state;



a fourth step of welding the components necessary for the vessel formation to the winding former; and

a fifth step of injecting a hardenable material into the annular space having the coil structure disposed therein after the winding former heated in the welding step has been cooled to temperatures lower than a prescribed level so as to impregnate the coil structure with the hardenable material, whereby the coil structure impregnated with the hardenable material is prevented from cracking causing deterioration of properties such as reduction of magnetomotive force.

4,640,006

METHOD OF FORMING BATTERY ELECTRODE BY IRREVERSIBLE DONOR DOPING OF CONJUGATED BACKBONE POLYMERS

Ronald L. Elsenbaumer; Granville G. Miller, both of Morristown, and James E. Toth, Maplewood, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 556,718, Nov. 30, 1983, Pat. No. 4,526,708. This application Jun. 17, 1985, Ser. No. 745,099

Int. Cl.[4] H01M *10/38;* **H01B** *1/06*

U.S. Cl. 29—623.1 **12 Claims**

1. A method of fabricating a battery comprising the step of introducing a compound of the formula MR into a battery enclosure containing at least two electrodes, at least one of which comprises polyacetylene and also containing an organic solvent, under conditions forming negatively charged polyacetylene intercalated by M^+ cations in an amount sufficient to produce a conductivity in said polyacetylene of at least 10^{-5} S/CM and an organic by-product not susceptible to reaction with negatively charged polyacetelene to reform the compound MR; M being an alkali metal and R being selected from the group consisting of alkyls 1–12 carbons, phenyl and alkylphenyls of 7–12 carbons.

4,640,007

APPARATUS AND METHOD FOR REPLACING BEARINGS IN A WALKING BEAM IN TRUCKS AND TRAILERS HAVING TANDEM AXLES

Ronald Hydorn, 6820 54th St. NE., Marysville, Wash. 98270

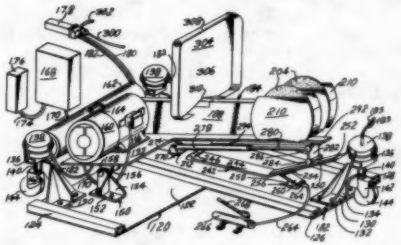
Filed Dec. 10, 1984, Ser. No. 680,289

Int. Cl.[4] B23P *21/00, 7/00, 19/02;* **B23Q** *15/00*

U.S. Cl. 29—709 **22 Claims**

1. A portable apparatus for removing a beam end connection assembly positioned in an equalizer beam and in a beam hanger axle bracket wherein said beam end connection assembly comprises an inner tube and a beam end bushing, said apparatus comprising:

a. a severing means for severing said inner tube and said beam end bushing of said beam end connection assembly on both sides of said equalizer beam and between two legs of said beam hanger axle bracket, simultaneously;



b. a first means for positioning said severing means in a position to simultaneously sever said inner tube and said beam end bushing in two spaced apart places; and,

c. a second means for activating said severing means to simultaneously sever in two spaced apart places said inner tube and said beam end bushing.

4,640,008

APPARATUS FOR COMBINING FASTENER STRINGERS

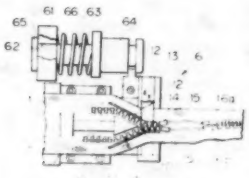
Kazuki Kuse, Toyama, Japan, assignor to Yoshida Kogyo K. K., Japan

Filed Apr. 9, 1985, Ser. No. 721,396

Claims priority, application Japan, May 10, 1984, 59-68178[U]

Int. Cl.[4] A41H *37/06;* **B29D** *5/00*

U.S. Cl. 29—767 **1 Claim**



1. In a stringer combining apparatus including a stringer combining guide section having an outer guide member resiliently movable in an outward direction transversely of a stringer, said member being located at the junction of guide groove portions which in combination constitute a Y-shaped guide groove, thereby allowing the passage of members other than fastener elements attached to a stringer, and a conveyor device for conveying a pair of stringers through said guide section, an improvement comprising a fluid-pressure cylinder means connected to said guide section for moving said guide section linearly in the direction parallel with the moving direction of said stringers.

4,640,009

CO-AXIAL CABLE STRIPPING TOOL AND END PORTION PREPARATION METHOD

Barry P. Liversidge, 9 Heather Close, Layer-de-la-Haye, Colchester, Essex, England

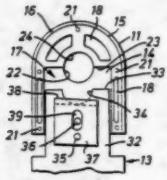
PCT No. PCT/GB85/00024, § 371 Date Aug. 23, 1985, § 102(e) Date Aug. 23, 1985, PCT Pub. No. WO85/03389, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 18, 1985, Ser. No. 770,870

Claims priority, application United Kingdom, Jan. 20, 1984, 8401513; May 25, 1984, 8413445

Int. Cl.[4] H01B *13/20*; B26B *27/00*

U.S. Cl. 29—828 11 Claims



1. A tool suitable for stripping distinct layers from a multilayer elongate member, which tool comprises a body defining an opening in which may be received the member to be stripped, and a cutting blade pivotally mounted with respect to the body and movable between the two limiting positions in the first of which the cutting edge of the blade projects to a relatively large extent into the opening and in the second of which the cutting edge projects to a relatively lesser extent into the opening, whereby following the location of a multilayer member in the opening and rotating the tool around the member in one sense, the blade is caused to move to one limiting position such that the cutting edge substantially severs several layers of the member, but on rotating the tool around the member in the other sense the cutting blade is caused automatically to move to its other limiting position such that the cutting edge severs fewer layers of the member.

9. A method for preparing the end portion of an elongate member having a core and at least three co-axial layers thereabout so as successively to expose the core and layers from the end of the member, which method comprises:

(a) effecting a first cut around the member at a position adjacent but spaced from the end of the member to a depth sufficient partially to sever the layer immediately overlying the core;

(b) twisting the so-severed layers around the core so as to complete separation of the end portion of the layer immediately overlying the core from the major portion thereof;

(c) effecting a second cut around the member at a position spaced further from the end of the member than the first cut and to the same depth as was effected the first cut;

(d) effecting a third cut around the member at a position spaced further from the end of the member than the second cut but to a lesser depth sufficient at least partially to sever the third layer overlying the second layer but not to sever that second layer;

(e) applying axially of the member and in the direction of the end thereof a force to the severed portion of the third layer at or immediately adjacent the third cut thereby to strip from the member successively from the third cut the third layer, the second layer and the first layer, so leaving an exposed length of the core at the end of the member.

4,640,010

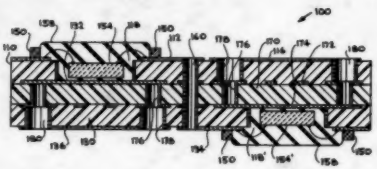
METHOD OF MAKING A PACKAGE UTILIZING A SELF-ALIGNING PHOTOEXPOSURE PROCESS

Candice H. Brown, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 29, 1985, Ser. No. 728,053

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—832 15 Claims



1. In a method for producing a PC board package for one or more integrated circuit dies wherein one or more cavities are formed in a first PC board to receive said dies and heat pipes are formed in a second PC board prior to bonding said PC boards together to form a composite, the improvement which comprises:

(a) applying a positive photoresist to the surface of said first PC board of the composite over said cavity;

(b) exposing the back surface of said photoresist over said one or more cavities to light;

(c) developing said photoresist to provide an accurate mask over the surface of said composite to the edge of said one or more cavities; and

(d) simultaneously plating the walls of said heat pipes and the cavity walls.

4,640,011

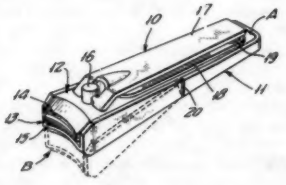
NAIL CLIPPER

William L. Gamble, Unionville, Conn., assignor to The W. E. Bassett Company, Derby, Conn.

Filed Jul. 30, 1985, Ser. No. 760,460

Int. Cl.[4] A45D *29/00*

U.S. Cl. 30—28 6 Claims



1. As an article of manufacture, a nail-clipping retainer for a nail clipper having two like elongate jaw members securely connected to each other at a connected-jaw member end and divergent longitudinally in the direction away from said connected-jaw member end, said jaw members having mutually facing and inwardly projecting coacting cutting edges at cutting ends longitudinally opposite the connected-jaw member ends thereof, thereby defining between said jaw members an open-sided cavity which converges toward said connected-jaw member end, and an actuator foldable along the outer surface of one of said jaw members and actuably connected to said jaw members for a cutting operation of said cutting edges, said retainer comprising an elongate channel of compliantly deformable material having a bottom panel conforming to the planiform of the other of said jaw members, said bottom panel being in confronting adjacency with the outer surface of said other jaw member, said channel further having like side panel connected by said bottom panel, means coacting between said

jaw members and said channel for retaining said channel to said clipper at least at said connected-jaw member end, the elevational contour of said side panels above said bottom panel conforming substantially to the elevational profile of the opensided cavity and substantially closing the same, each of said side panels having a transverse slit at a longitudinally central location, each said slit extending the width of its side panel and at least to said bottom panel, whereby said channel is characterized by a selectively movable end near said cutting ends and said selectively movable end is compliantly hinged to a retained end near said connected-jaw member end.

4,640,012

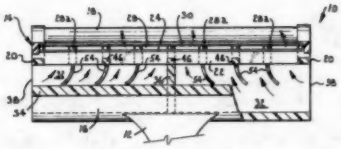
RAZOR CONSTRUCTION

Perry W. Thomas, 12708 12th St., Grandview, Mo. 64030

Filed May 28, 1985, Ser. No. 737,781

Int. Cl.⁴ B26B *21/22*

U.S. Cl. 30—41 **11 Claims**



1. A razor comprising:

a shaving head having opposite ends and a longitudinal dimension defined between said ends;

a razor blade carried on said shaving head and having an exposed shaving edge extending generally longitudinally on said head for use in shaving;

a handle extending from said shaving head;

a passage extending generally longitudinally within said shaving head and having an inlet end at one end of the shaving head for receiving water;

an outlet for said passage located adjacent said shaving edge of the blade for discharging water from the passage against said edge to clear shaving debris from the blade; and

a plurality of curved baffles in said passage spaced apart from one another at locations to divert water from the passage toward said outlet, each baffle having a concave surface facing toward said inlet end of the passage.

4,640,013

DEVICE FOR WRAPPING A JUNCTION BAND AROUND A PAIR OF CIGARETTES

Athos Cristian, Bologna, Italy, assignor to SASIB S.p.A., Bologna, Italy

Filed Sep. 6, 1983, Ser. No. 529,854

Claims priority, application Italy, Sep. 10, 1982, 12618 A/82

Int. Cl.⁴ A24C *5/47*

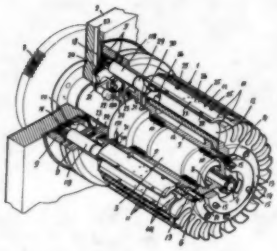
U.S. Cl. 131—94 **14 Claims**

1. A wrapping device for wrapping a junction band around a cigarettes-and-filter assembly which includes a double filter interposed between the ends of two aligned cigarettes, the wrapping device receiving from an input device a cigarettes-and-filter assembly with a junction band attached thereto by an end margin thereof and delivering, to an output device spaced apart from the input device, the wrapped cigarettes-and-filter assembly, said wrapping device comprising:

a drum rotatably mounted adjacent said input and output devices;

a peripheral annular assembly of wrapping units angularly equi-spaced from each other around said drum, each wrapping unit including a first wrapping member fixedly mounted on said drum and having a first active surface with an arcuate curvature, and a second wrapping member movably mounted on said drum and having a second active surface with an arcuate curvature, one of said arcuate curvatures being concave and the other being convex, said arcuate curvatures being coaxially disposed and having different radii, said second wrapping member additionally having a delivery end portion and a receiving end portion between which the arcuate curvature of said second wrapping member is disposed; and

means for moving the second wrapping member of a wrapping unit with respect to the first wrapping member thereof in a cycle between first and second predetermined positions as said drum rotates, said second active surface being directed away from said first active and exposed to said input device when said second wrapping member is in said first predetermined position, and said second active surface and delivery end portion being directed toward



said first active surface when said second wrapping member is in said second predetermined position, wherein said cigarettes-and-filter assembly is deposited at said receiving end portion of said second wrapping member with said junction band stretched across said second active surface toward said delivery end portion when said second wrapping member is in said first predetermined position, wherein said cigarettes-and-filter assembly engages said first wrapping member and is rolled thereby over said second active surface to the delivery end portion to wrap said junction band as said second wrapping member moves to said second predetermined position, and wherein the wrapped cigarettes-and-filter assembly is moved from said delivery end portion to said output device as said second wrapping member returns to said first predetermined position.

4,640,014

DIMENSIONAL CHECKING TOOL

Arthur Thomas, Liverpool, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 14, 1986, Ser. No. 818,840

Claims priority, application United Kingdom, Jan. 15, 1985, 8500962

Int. Cl.⁴ G01B *7/14*

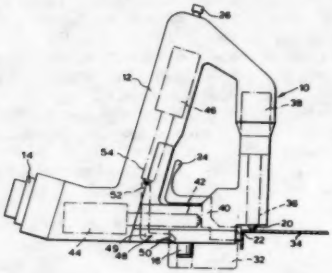
U.S. Cl. 33—143 L **7 Claims**

1. A dimensional checking tool for checking a pressing, said tool having a housing to be held in the hand, locating means for locating the housing at a fixed point on a jig, first and second movable probes linearly movable into and out of the housing along different paths, means biasing the probes in a direction outwardly of the housing and means for indicating the positions of the probes relative to the housing,

wherein the different paths along which the probes move are at right angles to each other so that one probe measures "gap" and the other probe measures "flush";

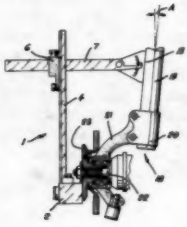
wherein the means for indicating the positions of the probes comprise linear transducers which respond to linear movement of the probes and provide a signal indicative of the instantaneous positions of the probes;

wherein a switch is provided for operation when the tool is fully located, to allow signals from the transducers to be passed from the tool to a remote data capture location;
wherein the switch is a push on/release off button; and



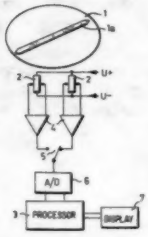
wherein one of the probes is connected to a manually movable slide by which it can be withdrawn into the housing to enable the tool to be applied to the pressing to be checked.

4,640,015
MACPHERSON STRUT ALIGNMENT GAUGE AND STRAIGHTENING APPARATUS
James H. Mason, 786 Pittwater Road, Brookvale, New South Wales 2100, Australia
Filed Dec. 20, 1984, Ser. No. 684,103
Claims priority, application Australia, Dec. 20, 1983, PG2918
Int. Cl.⁴ G01B *3/38*
U.S. Cl. 33—181 AT **11 Claims**



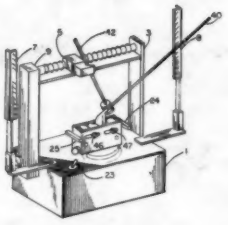
1. Gauge apparatus for measuring the displacement of first and second components, said apparatus comprising:
a support member adapted to secure attachment to the first component, said member including an elongate bar having one end adapted for attachment to the first component, said one end including a threaded portion projecting coaxially from the one end of said support member, thereby being able to engage a complimentary threaded hole in a wheel support flange;
a transverse gauge bar;
means for slidably interengaging said gauge bar to the elongate bar of said support member to provide for selectable relative movement of said gauge bar along a predetermined path on said support member;
locking means for rigidly securing said transverse gauge bar to said support member at a pre-selected position along said path; and
a gauge member rotatably secured to the distal end of said transverse gauge bar, said gauge member including indicia for measuring the angle of displacement of said gauge member with respect to said gauge bar.

4,640,016
MEANS FOR INDICATING DIRECTION AND A METHOD OF DETERMINING A DIRECTION
Risto Tanner, Lukupuronrinne 2 A 2, 02200 Espoo, and Hannu Purhonen, Visamäki 4 A 6, 02130 Espoo, both of Finland
Filed Dec. 18, 1985, Ser. No. 810,913
Claims priority, application Finland, Dec. 19, 1984, 845043
Int. Cl.⁴ G01C *17/38*
U.S. Cl. 33—356 **8 Claims**



1. Advice for the determination of direction, comprising:
a turnable indicator having magnetic properties mounted to a frame,
two or more sensors, the operation of which is based on the dependence of the resistance of the magnetic material on a magnetic field exerted thereon, the sensors being secured on said frame and located on a plane parallel with the turning plane of the turnable indicator,
an A/D-converter for converting the sensor values into digital form, the input of said converter being connected to the sensors,
a signal treating processor connected to the output of the A/D-converter, which signal treating processor has in its memory at least one predetermined table, on the basis of which the processor determines a preliminary direction approximation, and a predetermined correction table for correcting the preliminary direction approximation, and
a display for displaying the corrected direction data, said display being connected to the output of the signal treating processor.

4,640,017
GOLF CLUB ADJUSTING MACHINE
Viktor Cukon, 1902 Golden Circle Dr., Escondido, Calif. 92026
Filed Sep. 8, 1986, Ser. No. 905,291
Int. Cl.⁴ G01B *5/24*
U.S. Cl. 33—508 **1 Claim**



1. In devices for measuring and adjusting the angle of lie and loft of a golf club wherein the improvement comprises:
(a) a base having a club holding vice centrally mounted on the top surface thereof;
(b) the vice having a center fixed jaw and movable jaws on either side of the center jaw;

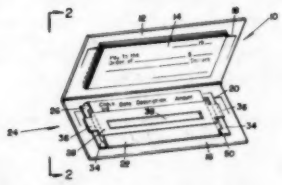
(c) the vice rotatable in azimuth on the top of the base;
(d) the faces of the center jaw of the vice vertical with respect to the base surface;
(e) the bottom surface of the vice vertically adjustable;
(f) a vertical scale, in the vertical plane of the vice, mounted to the base on each side of the vice;
(g) the vertical scale spring mounted to allow deflection backwards from the normal front position;
(h) rotatable vertical supports in a vertical plane back of the vertical scales supporting a horizontal threaded shaft;
(i) a threaded nut on the horizontal shaft driven side to side by rotation of the shaft forming a screw jack;
(j) a chain and sprocket drive from a base mounted, down-geared electrical motor driving the horizontal shaft;
(k) a manual control for disengaging the sprocket drive for manually rotating the threaded shaft;
(l) the threaded nut on the screw jack having a clevis for holding a bending wrench; and
(m) the bending wrench having a clevis on the lower end for engaging the hostel of a golf club.

4,640,018

CHECKBOOK RECORDING DEVICE

Fred Gigliotti, 42 Meadow Dr., Greensburg, Pa. 15601

Filed Jan. 24, 1986, Ser. No. 822,399
Int. Cl.[4] G01B *3/00*
U.S. Cl. 33—562 **11 Claims**



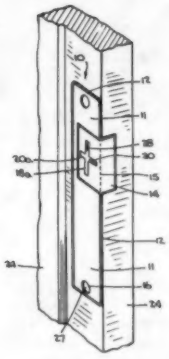
1. A device for automatically transferring a transaction during the issuing of a negotiable instrument, such as a check or the like, to a record keeping ledger, comprising:
a folder with front and back covers, and at least an inner pocket on the inside of said folder,
a first template having a portion insertable into said pocket of said folder and opposed legs alongside said insertable portion for extending out of said pocket when said insertable portion thereof is inserted into said pocket, and
a second template having window means and cooperating with said first template, said second template having opposed projections each for receiving one of said opposed legs and slideable thereon and over said first template,
said first and second templates further arranged to receive pressure sensitive paper means therebetween so that upon said sliding of said second template over said first template, said window means of said second template comes into registry with a selected space on said pressure sensitive paper means, and where, upon the placement of said negotiable instrument directly onto said second template and in the making of said transaction on said negotiable instrument, data from said transaction is transferred through said window means onto said pressure sensitive paper means.

4,640,019

TEMPLATE FOR INSTALLATION OF ELECTRIC DOOR STRIKES

Gary Paley, Cornwall-on-Hudson, N.Y., assignor to Trine Products Corporation, Bronx, N.Y.

Continuation of Ser. No. 652,385, Sep. 20, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 856,851
Int. Cl.[4] E05B *17/06*
U.S. Cl. 33—563 **5 Claims**



1. A template for outlining an area on a door jamb which is to be removed to facilitate the installation of an electric door strike into the door jamb, said template comprising a flexible, paperlike sheet in the shape of a front view of an electric door strike, said template further having a section for outlining, on the side of the jamb, a portion within said area to be removed which is cut deeper to accomodate installation of the electric door strike, said section protruding from the side of the template and having a fold line scored therein to facilitate the folding of the section over the jamb; a first open area in the form of a cross, disposed along the interior of said sheet, said first open area allowing a portion of the jamb to be viewed therethrough when said template is placed over the jamb, means for retaining the template to the jamb comprising an adhesive applied to the back of the template such that the adhesive will temporarily maintain the template on the jamb, such that when a select portion of the jamb has a pair of locating marks placed on the jamb at select locations the placement of the first open area over the marks aligns the template over the portion of the jamb to be removed, and second and third open areas spaced from the first open area for indicating the location for drilling screw holes in said jamb such that placing the template over the jamb indicates the portion of the jamb to be removed for installation of the electric door strike.

4,640,020

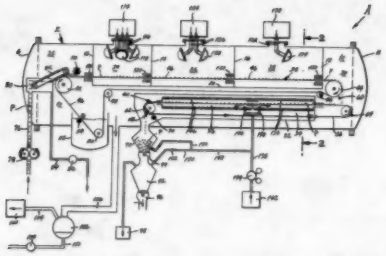
ZONED MICROWAVE DRYING APPARATUS AND PROCESS

Frederick C. Wear, and Howard F. McKinney, both of St. Louis County, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 27, 1985, Ser. No. 802,265
Int. Cl.[4] F26B *3/347*
U.S. Cl. 34—1 **28 Claims**

1. A drying apparatus for removing moisture from a product, said apparatus comprising: an air-tight vessel which encloses a chamber that is isolated from the surrounding atmosphere and maintained at a pressure substantially less than that of the surrounding atmosphere; conveyor means within the chamber for moving the product through the chamber; dividing means extending across the chamber for dividing the chamber into a plurality of successive microwave zones through which the conveyor means moves the product, the dividing

means further isolating each zone from the others in the sense that it prevents microwave radiation from passing from one zone to the next; loading means for introducing the moisture-laden product into the chamber without affecting the pressure within the chamber and for further depositing a product on the conveying means; discharge means for collecting the product from the conveyor means and for removing it from the chamber without affecting the pressure within the chamber; and a



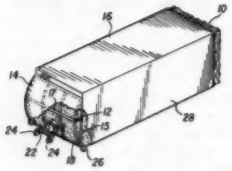
separate source of microwave energy presented at and directed into each microwave zone for introducing microwave energy into that zone at a frequency capable of exciting the molecules of water which constitute the moisture of the product that is within the zone, the source of microwave energy for any zone supplying the energy at a power density which maintains the field strength in the zone less than that at which ionization will occur within the zone.

4,640,021

HAY DRYING APPARATUS

M. Roy Gullickson, P.O. Box 70, Barons, Alberta, T0L 0G0, Canada

Filed May 16, 1985, Ser. No. 734,491
Int. Cl.[4] F26B *5/12*
U.S. Cl. 34—15 **16 Claims**



5. A method of drying a stack of hay bales, including covering a first end, top and sides of said stack, leaving a second end uncovered, forming a chamber substantially co-extensive with said first end and exhausting air from said chamber such that air enters said stack from the second end thereof, passes through the stack and exits out of the first end.

4,640,022

CLOTHES DRYER

Masami Suzuki, Shiga; Tatsuya Hirota, Kyoto, and Masahiko Maeda, Shiga, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Feb. 19, 1985, Ser. No. 702,834
Claims priority, application Japan, Feb. 20, 1984, 59-30737
Int. Cl.[4] F26B *25/22*
U.S. Cl. 34—48 **9 Claims**

1. A clothes dryer of the dehumidifying type, which comprises:

a rotatable drum for receiving a wash load for drying, the drum defining an interior drying space;

means defining an air outlet, the air outlet being in communication with the interior drying space of the drum and provided for allowing exhaust air from the interior drying space to pass therethrough;

means defining an air inlet, the air inlet being in communication with the interior drying space of the drum and provided for allowing reheated and dehumidified exhaust air to reenter the interior drying space;

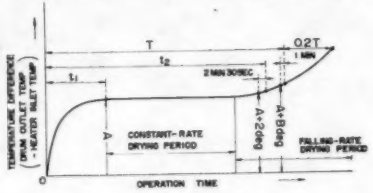
a heat exchanger, the heat exchanger being in communication with the air outlet and provided for subjecting the exhaust air to heat exchange with external air entering the clothes dryer and for dehumidifying the exhaust air;

a heater being in communication with the heat exchanger and provided for heating the dehumidified exhuast air;

a fan being in communication with the air inlet and provided for supplying the reheated exhaust air to the drum drying space;

first heat-sensitive means for measuring the temperature of the exhaust air at the air outlet;

second heat-sensitive means for measuring one of the temperature of the exhaust air after the exhaust air has been



dehumidified by the heat exchanger but before the exhaust air has been reheated by the heater and the temperature of the external air after the exhaust air has been subjected to heat exchange with the external air, the second heat-sensitive means being adapted to measure the temperature of the exhaust air or the external air at a predetermined time after a heat drying operation of the clothes dryer has started and being adapted to continually measure said temperatures subsequent to said predetermined time;

memory means for storing, as a reference value A, the difference between the temperatures measured by the first and second heat-sensititve means; and

control means for terminating the heat drying operation after a preselected time has elapsed from when the difference between the temperatures continually measured by the first and second heat-sensitive means subsequent to the predetermined time at least equals the sum of reference value A and a selected value B, the value B varying in accordance with the time which has elapsed from the start of the heat drying operation.

4,640,023

APPARATUS FOR MANUFACTURING POWDERED SILICON NITRIDE

Masaaki Mori; Akira Sano; Yushi Horiuchi, and Yoshihiro Okumura, all of Kariya, Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,566
Claims priority, application Japan, Jul. 7, 1985, 60-146654; Oct. 3, 1985, 60-219129; Oct. 3, 1985, 60-219130; Oct. 3, 1985, 60-219131
Int. Cl.[4] F26B *17/00, 3/00, 19/00*; F27B *15/00*
U.S. Cl. 34—57 A **14 Claims**

1. A batch-operated furnace apparatus for manufacturing powdered silicon nitride comprising;

a reaction furnace having a reaction chamber, an upper portion, a bottom portion and a side portion;

a feed pipe placed at the upper portion of the reaction fur-

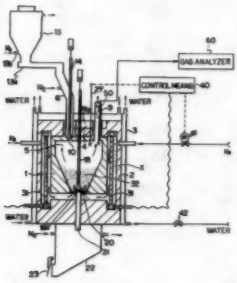
nace for feeding starting materials in a fine or coarse particle form;

an exhaust pipe placed at the upper portion of the reaction furnace for removing gasses from the reaction chamber;

a gas disributor plate positioned at the bottom portion of the reaction chamber for introducing nitrogen gas into the reaction chamber so as to form a fluidized bed at the bottom portion of the reaction chamber;

a heater for heating the starting materials of the fluidized bed within the reaction chamber;

a discharge port formed in the gas distributor plate;



a discahrge pipe joined to the discharge port of the gas distributor plate;

a valve seat formed at the discharge port;

a discharge valve means having the valve which engages the valve seat of the discharge port; and

a guide tube provided at an upper portion of the reaction furnace;

the discharge valve means extending through the guide tube in a vertical direction in such a way that the valve of the discharge valve means selectively contacts the valve seat of the discharge port thereby to open or close the discharge port.

4,640,024

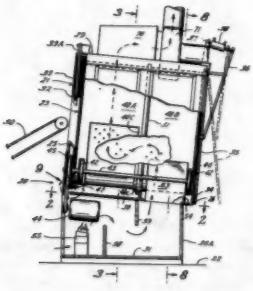
APPARATUS FOR TREATING CLOTH GOODS

William C. Files, Destrehan; Norvin L. Pellerin, New Orleans; Somsak S. Rodboon, Kenner, and Thomas M. Pearce, River Ridge, all of La., assignors to Pellerin Milnor Corporation, Kenner, La.

Continuation-in-part of Ser. No. 578,704, Feb. 9, 1984, abandoned. This application Oct. 1, 1984, Ser. No. 656,767

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—133 **35 Claims**



1. A tumble dryer, comprising a housing, drum mounted within the housing including a substantially cylindrical wall rotatable about a generally horizontal axis, means for so rotating the wall, means by which goods may be loaded into and unloaded from the drum, means separating the space between the housing and drum intermediate the ends of the drum to define one space portion on one side thereof and another space portion on the other side thereof, and housing including means providing an air inlet to the one space portion and an air outlet from the other space portion, said cylindrical wall having perforations about its circumference on both sides of the separating means for connecting the interior thereof with both space portions, means for circulating heated air from the inlet through the one space portion and into the drum through the perforations on one side of the separating means and out of the drum and through the perforations on the other side of the separating means and the other space portion to the outlet, so that the goods in the drum are directly contacted by the heated air, and means for causing goods in the drum to move toward the end thereof connecting with the one space portion while directing air from said one space portion into perforations in the bottom of the drum.

4,640,025

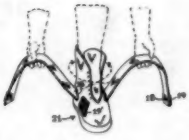
FIGURE EIGHT SHOE TIE SYSTEM

Joseph M. DeRenzo, P.O. Box 6833, Thousand Oaks, Calif. 91359

Filed Apr. 17, 1985, Ser. No. 724,235

Int. Cl.[4] A43B *5/00, 11/00*; A61F *13/06*

U.S. Cl. 36—50 **1 Claim**



1. An improved tie system in combination with footwear such as shoes having a sole and an upper; wherein the tie system consists of:

fastening means affixed on opposite sides of the shoe upper adjacent the arch; and

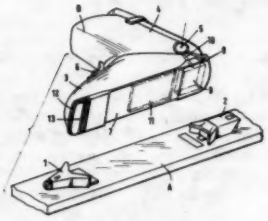
a pair of elongated wide resilient strap elements each having one end affixed on opposite sides of the shoe adjacent the arch and each having a free end provided with complementary fastening means; wherein the free ends of the strap elements extend across the top of the shoe upper, wrap around the back of the users ankle, and recross the tops of the shoe upper; whereby the complementary fastening means on the free ends of the strap element engage the fastening means on the opposite sides of the shoe upper adjacent the arch, thereby producing a double wrap tie system; whereby, each of said strap elements originates and terminates on opposite sides of the shoe proximate the sole of the shoe, to encircle the users foot in a substantially completed figure eight wrapping pattern.

4,640,026

SKI BOOT WITH RELEASE MECHANISM

Bernhard Kirsch, Im Litzelholz 23, 5500 Trier, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,104
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340051; Aug. 8, 1984, 3432065
Int. Cl.[4] A43B 5/04; A63C 9/08, 9/088
U.S. Cl. 36—117 9 Claims



1. In a ski boot fittable in a safety ski binding of a ski and having a foot portion, an ankle portion pivotally mounted on such foot portion for swinging about a horizontal transverse axis in the heel region of the boot and locking mechanism for deterring relative movement of such foot and ankle portions, the improvement comprising a release member pivotally mounted on the boot foot portion for swinging about the same horizontal transverse axis in the heel region of the boot between a locked position in which said release member is engaged in the binding for holding the ski boot on the ski and a released position in which said release member is out of engagement with the binding so as to release the boot from the ski, and control means carried by the boot for normally maintaining said release member in its locked position but actuatable by force in excess of a predetermined force being exerted on the boot to permit movement of said release member to its released position.

4,640,027

MOTORCYCLE BOOT WITH POSITIVE AIR CIRCULATION

Remo Berlese, 31036 Ospedaletto di Istrana, Treviso, Italy

Filed Oct. 22, 1985, Ser. No. 790,108
Int. Cl.[4] A43B 5/14, 7/06
U.S. Cl. 36—131 15 Claims

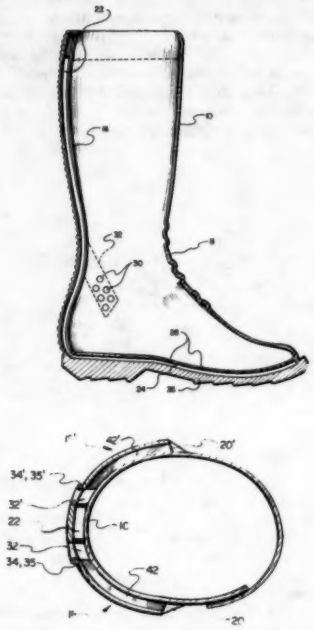
1. In a motorcycle boot having a lower foot portion with a bottom sole, an upper leg portion and an intermediate ankle portion, the improvement comprising:

forward directed air scoop means on the exterior of the boot adapted to take in air in response to the wearer riding forward on a motorcycle,

an air distribution network at the sole for distributing intake air along the underside of the wearer's foot,

intake duct means providing a passageway to deliver air taken in by the air scoop means to the air distribution network, and

an air exhaust means extending from a location in the interior of the boot above the bottom of the foot to the exterior of the boot for venting air which has entered the air scoop means and flowed through the intake duct means to the air distribution network, the air exhaust means completing a



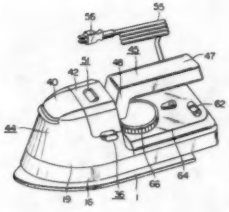
circulation path through the boot for air which has entered the boot through the air scoop means.

4,640,028

COMBINATION STEAM IRON AND STEAMER

Seiichi Nakada, Amagasaki; Tool Hanada, Takarazuka, and Masao Watanabe, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 28, 1985, Ser. No. 738,180
Claims priority, application Japan, Jun. 1, 1984, 59-113333
Int. Cl.[4] D06F 75/18
U.S. Cl. 38—77.7 6 Claims



1. An electric iron comprising: a base adapted to be heated by a heater; a steam generating chamber provided in said base; a water tank provided above said steam generating chamber; a control means for starting and stopping the feed of water from said water tank into said steam generating chamber thus allowing control of the generation of steam; a main body; and a handle; said control means including an aperture providing communication between said water tank and said steam gener-

ating chamber, and a means provided along the rear wall of said water tank for opening and closing said aperture, said aperture being provided in a rear portion of the bottom of said water tank to supply water onto a water receiving surface which is provided at the front side of the center of said base.

4,640,029

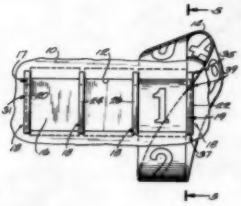
MOBIUS STRIP AND DISPLAY UTILIZING THE SAME

Richard P. Hornblad, Shorewood, and Gerald R. Sorensen, Milwaukee, both of Wis., assignors to DCI Marketing, Milwaukee, Wis.

Continuation-in-part of Ser. No. 491,741, May 5, 1983, abandoned. This application Aug. 7, 1984, Ser. No. 638,861

Int. Cl.[4] G09F *11/18*

U.S. Cl. 40—5 9 Claims



1. A display device comprising

a display panel having oppositely facing generally parallel front and back surfaces,

means defining a window in said display panel,

a support member having a generally planar surface arranged parallel to and oppposed to said back surface of said display panel,

means on said support member defining planar projection surfaces spaced along said support member and lying in a plane parallel to but spaced apart from the plane of said planar surface of said support member,

said planar projection surfaces being arranged to overlap said front surface of said display panel adjacent opposite sides of said window, and said planar surface of said support member being arranged to engage said back surface of said display panel, and

means on said support member defining notches between said planar projection surfaces and said planar surface of said support member sufficient to permit said support member to move relative to said display panel so that said planar projection surfaces can be selectively moved to clear said front surface of said display panel to permit removal of said support member from said display panel, and

a flat continuous tape in the form of a loop and having a 180° twist therein so as to form a mobius strip, said tape having indicia on both sides thereof and being supported by said support member in said window.

4,640,030

COMBINATION ENVELOPE AND DISPLAY DEVICE

Marcus B. Wood, and Richard K. Owen, both of 174 Woodstock Ct., Claremont, Calif. 91711

Filed Jun. 8, 1984, Ser. No. 618,565

Int. Cl.[4] G09F *1/10*

U.S. Cl. 40—158 R 8 Claims

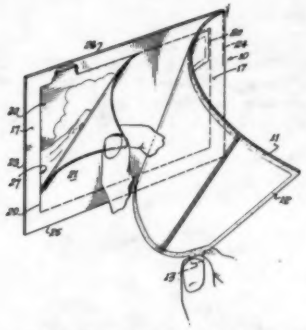
1. A combination envelope and display device comprising:

a front surface, a bottom flap and a pair of side flaps folded to define and envelope enclosure having an open side, said front surface defining a window portion;

a removable address panel overlying said window portion and including adhesive means for removably attaching said removable address panel to said front surface; and

a support flap, hingeably attached to said front surface along said open side of said envelope enclosure;

said support flap alternatively configurable to either a first position in which said envelope enclosure is sealed or a second position to provide a support for display use of said combination envelope and display device and when said support flap includes a deposit of delayed tack adhesive located upon said support flap, such that said support flap is removably attached to said bottom and side flaps when



said support flap is configured in said first position and wherein said bottom flap defines a first generally U-shaped tab cutout and wherein said support flap may be configured in a third position in which a portion thereof is received beneath said first tab cutout.

4,640,031

GAS CYLINDER IDENTIFICATION DEVICE

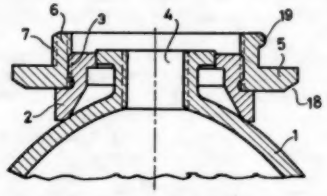
Cornelis Hoek, Oud Beyerland, and Jurjen L. van Ditten, Schiedam, both of Netherlands, assignors to N.V. W.A. Hoek's Machine, Schiedam, Netherlands

Filed Nov. 10, 1983, Ser. No. 551,371

Claims priority, application Netherlands, Nov. 12, 1982, 8204413

Int. Cl.[4] G09F *3/00*

U.S. Cl. 40—306 15 Claims



1. A combination lifting aid/code carrier device for use with cylindrical gas containers of the type having a valve neck of reduced diameter relative to the container diameter, the valve neck including an upper end, said device comprising:

a ring body;

mounting means for securing said ring body on to the cylinder neck;

said ring body having portions extending radially to the neck and engageable by a lifting tool for lifting a gas container secured to the ring body for transport in a suspended condition;

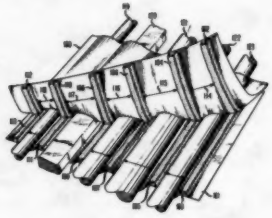
said ring body being of reduced dimension relative to the cylinder diameter so as to be protected from lateral impact on the container; and

code carrier means disposed within a recess in said ring body, a protective cap removably affixed to said ring body, said code carrier having claw elements removably securing said code carrier to said ring body, said claw elements being accessible for disengagement from said ring body only upon removal of said protective cap;

said mounting means being configured and constructed for positioning said code carrier means at a predetermined

distance from said upper end when said ring body is seated on the cylinder neck.

4,640,032
WIRE AND CABLE ORGANIZING SLEEVE
George L. Lewis, Westminster, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.
Filed Jul. 23, 1984, Ser. No. 633,643
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—316 2 Claims



1. A wire and cable organizing sleeve for individually ordering a plurality of specified wires or cables of differing gauges and lengths comprising:

at least a pair of flexible plastic sheets having interior facing surfaces and exterior facing surfaces for forming said sleeve;

a plurality of a first type of elongated base strips distributed along the length of and affixed to an interior facing surface of a first sheet of each pair of said plastic sheets with said first type of elongated strips having a plurality of deformable hooks bonded to and randomly distributed over the length of and extending outwardly from said first type of elongated strips;

a plurality of a second type of elongated base strips distributed along the length of and affixed to an interior facing surface of a second sheet of each pair of said plastic sheets with said second type of elongated strips having a resilient pile of looped filaments bonded to said second type of elongated strips and extending outwardly therefrom over substantially the entire length thereof, said hooks of said first type of elongated strips being adapted to releasable engage said looped filaments of said second type of elongated strips; and

at least two or more spatially separated adjacent ones of said first type of elongated strips having a one to one correspondence in a facing relationship to a like number of spatially separated adjacent ones of said second type of elongated strips for cooperatively joining said first and second interior facing surfaces of at least a pair of said plastic sheets;

wherein when said first and second type of elongated strips interposed between said first and second interior facing surfaces of said sheets are joined, the relative movement between said joined plastic sheets is inhibited;

wherein said first and second type of elongated strips are secured to all of said first and second interior facing surfaces of said plastic sheets by an adhesive substance;

wherein said plurality of wires or cables are secured between two spatially separated adjacent pairs of said first type of elongated strips having said correspondence to said second type of elongated strips such that there exists at least an equivalent number of spatial separations to an equivalent number of specified wires or cables.

4,640,033
ILLUMINATED CHILD'S TRAY
Ray P. Bulger, 1900 Primrose, Carrollton, Tex. 75007
Filed Feb. 15, 1985, Ser. No. 702,317
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—324 9 Claims

1. An illuminated tray comprising:

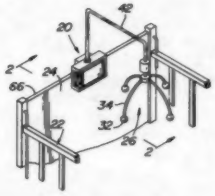
a tray surface having an artistic design thereon;

a plurality of electric lights mounted within said tray surface;

an electrical power source located within the tray; and

electrical circuit means connecting said power source to said electric lights, wherein the electrical circuit means includes a plurality of manual switches mounted on said tray surface, said manual switches selectively controlling the illumination of said electric lights.

4,640,034
MOBILE FOR INFANTS
Barry Zisholtz, 353 E. 17th St., New York, N.Y. 10003
Filed May 14, 1985, Ser. No. 733,998
Int. Cl.[4] G09F *27/00*
U.S. Cl. 40—455 7 Claims



1. A mobile for use on a structure holding an infant, said mobile comprising housing means including releasable mounting means for releasably mounting said mobile on said structure, plural decorative elements arranged to be moved through a predetermined path adjacent said infant, electrical motor means coupled to said elements and operative, when energized, for moving said elements through said path, audio tape player means releasably supported by said housing means and coupled to said motor means, said tape means including electrical power means, acoustic speaker means and at least one reel of magnetic tape, switch means coupled to said tape player means and said motor means for energizing said motor means from said electrical power means and for causing said tape player to operate, whereupon said voice on said tape is reproduced through said speaker means to be heard by said infant.

4,640,035

IDENTIFYING MEANS

Stuart S. Kind, Harrogate; David G. Sanger, Baughurst; John D. Twibell, Ashford Hill, Nr. Newbury, and John Hargraves, Newbury, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 18, 1982, Ser. No. 409,025

Claims priority, application United Kingdom, Sep. 3, 1981, 8126733

Int. Cl.[4] G09F *3/02*

U.S. Cl. 40—625 15 Claims

1. A particulate coding material comprising particles formed as thin transverse sections of an assembly comprising preexisting filaments twisted together and having their longitudinal surfaces in adherent contact, one with another, the individual filaments being of at least two different colors and/or compositions whereby each section has the same number of areas of each color and/or composition as every other section, wherein prior to sectioning into thin transverse sections the filaments of the assembly are transversely united only by the twist and the adherent contact, and, after sectioning, the filament sections of the particles are permanently transversely united only by said adherent contact, and wherein the assembly and the resulting particles are devoid of any surrounding cover about their exteriors.

4,640,036

GRIP AND STOCK ASSEMBLY FOR FACILITATING USE OF A COMPACT GUN

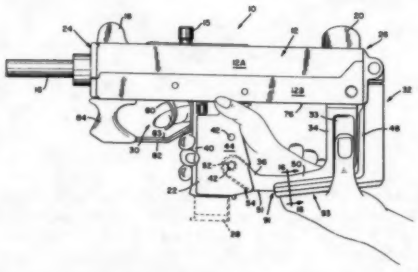
Uzi Gal, Philadelphia, Pa., assignor to UZI R & D Associates, New York, N.Y.

Continuation of Ser. No. 448,828, Dec. 10, 1982, Pat. No. 4,513,523. This application Apr. 29, 1985, Ser. No. 728,296

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.[4] F41C *23/00*

U.S. Cl. 42—72 19 Claims



1. An apparatus for use with a gun having an elongated receiver including a trigger, a forward end, a rearward end and an undersurface, said apparatus comprising:

a pistol grip for receiving one hand of the user, said pistol grip emanating outwardly from said undersurface a predetermined distance away from the forward end of said receiver;

a hand grip for receiving the other hand of the user, said hand grip emanating outwardly from said undersurface a predetermined distance ahead of said pistol grip; and

a trigger guard in association with said hand grip and said pistol grip surrounding and protecting the trigger and defining a triggering area, said triggering area being sized to simultaneously accommodate at least the trigger finger of said one hand of the user and the thumb finger of said other hand of the user.

4,640,037

TRAWL DOORS

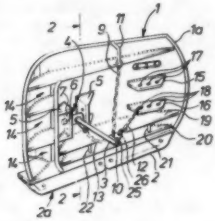
John F. H. Ashworth, Ashlands Farm, East Drayton, Retford, Nottinghamshire DN22 OLF, United Kingdom

Filed Mar. 1, 1983, Ser. No. 471,027

Claims priority, application United Kingdom, Mar. 2, 1982, 8206130

Int. Cl.[4] A01K *73/02*

U.S. Cl. 43—9 9 Claims



1. A trawl door comprising a body having inner concave and outer convex faces and having forward and rearward ends, a rigid bar member pivotally mounted on said inner face of said body for movement about a first axis extending lengthwise of said body, mounting means between the said bar member and said inner body face for mounting said bar member at a plurality of different lateral positions to calibrate said door to different operating conditions, means connected with said bar member for attaching a trawl warp to said bar member from a trawler, means on said outer face to said door to attach backstrops which are attachable to a trawl, and a resilient connection is provided between said bar member and a point on the inner face between said bar member and the rearward end.

4,640,038

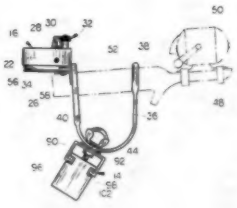
APPARATUS FOR SUPPORTING A FISHING ROD HOLDER

James T. Jershin, 3309 S. 122nd Street, Omaha, Nebr. 68144

Continuation-in-part of Ser. No. 512,459, Jul. 11, 1983, Pat. No. 4,541,196. This application Sep. 16, 1985, Ser. No. 776,540

Int. Cl.[4] A01K *97/12*

U.S. Cl. 43—17 12 Claims



6. An apparatus for supporting a fishing rod holder having a base with a mounting hole therein, siad apparatus comprising

an elongated channel strip including a top wall and a pair of spaced-apart depending side walls,

said top wall of the channel strip having a plurality of longitudinally space-apart holes therein,

said fishing rod holder being positioned with the mounting hole thereof in registered relation with a selected one of said top wall holes,

first fastener means insertable through said registered holes for securing said fishing holder on said channel strip,

flange means extended generally horizontally from said side walls in spaced relation from said top wall,

a ground stake having an elongated upper portion having top and bottom ends,

a support base secured to the top end of said upper portion and having a mounting hole therein,

an elongated generally cylindrical medial portion extended downwardly from the bottom end of said upper portion, and

a lower portion of reduced width relative to said medial portion secured to and extending downwardly from said medial portion for insertion into the ground,

said ground stake being positionable with the support base engaged against the undersides of said flange means and with the ground stake mounting hole in registered relation with a selected one of said top wall holes, and

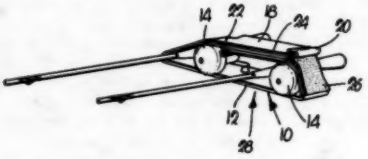
second fastener means insertable through said registered holes of said ground stake and channel strip top wall for securing said ground stake on said channel strip whereby a plurality of fishing rod holders may be supported on a single ground stake.

4,640,039

APPARATUS FOR RETAINING FISHING RODS IN A BOAT

John C. O'Neill, P.O. Box 4095, Overland Park, Kans. 66204

Filed Jul. 8, 1985, Ser. No. 752,632
Int. Cl.[4] A01K *97/08*
U.S. Cl. 43—21.2 **1 Claim**



1. In combination with a boat having a generally rigid supporting surface, apparatus for holding an article with respect to said surface comprising:

an elongated, flexible belt adapted to encircle the article to be held, said belt having a pair of opposed faces and a pair of terminal ends, one of said faces having a stretch thereof in overlying engagement with the supporting surface of the boat, said stretch being essentially parallel to said surface;

means for attaching the belt to said supporting surface, said means being located adjacent each end of said stretch whereby to retain the stretch in said overlying, parallel relationship to said supporting surface;

a first fastening tape secured to said one face of the belt between one terminal end of the belt and the proximal means for attaching the belt to the surface; and

a second fastening tape secured to the other face of the belt between the other terminal end of the belt and the proximal means for attaching the belt to the surface, said tapes being matingly engageable;

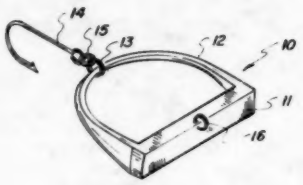
said belt being swingable about said spaced-apart attaching means whereby articles to be held with respect to said supporting surface may be placed at said stretch of the belt and the first tape placed over the articles to be held and said second tape brought into overlying engagement with the first tape to matingly engage the tapes over said stretch and said articles to thereby firmly hold said articles in place with respect to the supporting surface of the boat.

4,640,040

CYCLIC FISHING LURE CONTAINING A SLIDABLE FISHHOOK ASSEMBLY

Dale C. Smith, Salt Lake City, Utah, assignor to Dolly Varden Fishing Lures, Salt Lake City, Utah

Filed Jan. 13, 1986, Ser. No. 817,994
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42 **10 Claims**



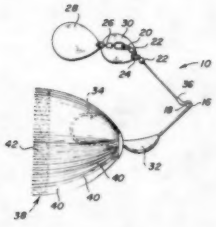
1. A cyclic fishing lure having a slidable hooking mechanism consisting of a front towbar having opposing ends, said towbar containing means centrally located relative to said opposing ends for attachment to a fishing line, said towbar being integral with a continuous track interconnecting the opposing ends of said towbar, said track depending backwardly and inwardly from said towbar thereby forming a rigid, uninterrputed cyclic structure, ring means encircling said track and slidable thereon and hooking means attached to said ring means.

4,640,041

SPINNER BAIT WITH ARMS OF DIFFERENT DIAMETER

Lonnie D. Stanley, Huntington, Tex., assignor to Stanley Jigs, Inc., Huntington, Tex.

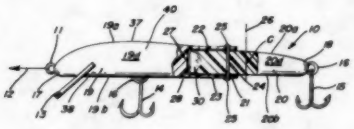
Filed Jun. 12, 1985, Ser. No. 744,144
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.13 **8 Claims**



1. An artificial fishing lure comprising a unitary wire body having different diameters at opposite ends thereof and formed in the shape of a V so as to have first and second arms integrally joined at an apex, said first arm having at least one spinner blade attached near the distal end thereof, a hook connected to the distal end of said second arm, a line attaching portion at the apex, the wire of said second arm having a significantly greater diameter than the wire of said first arm, said line attaching portion comprising a bent extension of said second arm and being of the same diameter as said second arm, said unitary wire body having a continuous and smooth taper from said line attaching portion to said first arm whereby said spinner blade is capable of generating vibration in said fishing

lure without significant dampening of said vibration by said first arm.

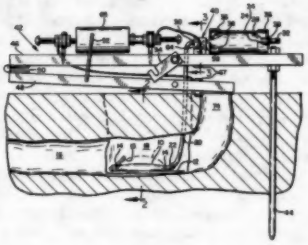
4,640,042
FISHING LURE
Lacy A. Rowe, 1851 Skycoe Dr., Salem, Va. 24153
Continuation-in-part of Ser. No. 596,381, Apr. 3, 1984, Pat. No. 4,573,282. This application Feb. 26, 1986, Ser. No. 832,894
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.15 **13 Claims**



1. An articulated fishing lure for simulating an injured minnow when pulled through water comprising a body having a top surface, a bottom surface, opposite side surfaces and front and rear ends, means at said front end for attaching a line and means at said rear end attaching a fishhook thereto, said body being symmetrical about a longitudinal plane extending through said top and bottom surfaces and comprising a leading body section, a trailing body section and hinge means pivotally connecting said leading and trailing body sections for swinging motion relative to each other, each of said leading and trailing body sections having front and rear ends, top and bottom surfaces and opposite side surfaces, said top and bottom surfaces and said opposite side surfaces of said leading and trailing body sections being part of the corresponding surfaces of said body, said hinge means comprising upper and lower bracket arms affixed to and extending rearwardly from the rear end of said leading body section and pivot means secured to said upper and lower bracket arms rotatably mounting said trailing body section to swing freely relative to said leading body section, said upper bracket arm overlying a portion of the upper surface of the trailing body section adjacent the front end thereof and said lower bracket arm underlying a portion of the bottom surface of said trailing body section, said trailing body section having a cupped cavity extending inwardly from the front end thereof and terminating short of the centroid of said trailing body section, and said pivot means being connected to said trailing body section rearward of said cupped cavity and forward of the centroid of said trailing body section.

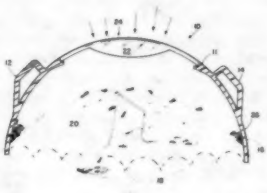
4,640,043
EXPLOSIVE RODENT TRAP
Perry J. Sigler, 58740 Dogwood La., St. Helens, Oreg. 97051
Filed Jun. 14, 1985, Ser. No. 744,752
Int. Cl.[4] A01M *27/00*
U.S. Cl. 43—84 **11 Claims**

1. A device for exterminating burrowing rodents comprising:
(a) container means for storing a pressurized gas including an opening through which said gas can be discharged;
(b) valve means for filling said container means with a pressurized gas;
(c) valve means for preventing the release of said gas through said opening;
(d) an elastic sack which is interconnected fluidly with said opening on said container means and is capable of being placed into or immediately adjacent to a burrow which was made by a rodent;
(e) means for explosively puncturing said sack when it is expanded to a predetermined size upon being filled with said pressurized gas; and



(f) trigger means for opening said valve means upon displacement of dirt caused by movement of said rodent in said burrow.

4,640,044
HOOD OR COVER USED TO ERADICATE FIRE ANTS
James W. Varnon, Rte. 1, Box 181, Beeville, Tex. 78102
Filed Oct. 2, 1985, Ser. No. 755,856
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—132.1 **5 Claims**

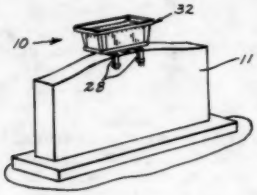


1. An ant hood for destroying ants in a mound, comprising:
a body having an open end, defining an inner cavity, said open end having a lower edge;
means attached to said body for intensifying solar radiation, thereby raising the temperature within said inner cavity;
handle means attached to said body; and
cutting means attached to said lower edge for facilitating insertion of said lower edge into the ground surrounding said mound.

4,640,045
FLOWER SADDLE FOR TOMBSTONES
Richard L. Nesbitt, 501 West Jensen, and Ricky R. Sievers, Rte. 2, both of Newell, Iowa 50568
Filed Feb. 25, 1985, Ser. No. 704,964
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—66 **6 Claims**

1. Apparatus comprising:
a grave marker having a lower portion adapted to be disposed in the ground and an upper portion extending above the ground;
a saddle disposed on top of said grave marker;
clamp means attached to the saddle for selectively securing said saddle to a top portion of said grave marker said clamp means comprising a first assembly including a first transverse frame member, a first pair of downwardly extending legs attached to each end of said first traverse frame member and having first abutment members attached to each lower end of said first downwardly extending legs, a first pair of telescoping members extending

from each end respectively of said first transverse frame member and extending transversely with respect to said first transverse member, a tubular internally threaded member rigidly attached at one end thereof to a central portion of said first transverse member and being disposed parallel to said first pair of telescoping members, a second assembly including a second traverse frame member, a second pair of downwardly extending legs attached to each end of said second transverse frame member said having second abutment members attached to each lower end of said second pair of downwardly extending legs, a second pair of telescoping members extending from each end respectively of said second transverse frame member and extending transversely with respect to said second transverse member, said first and second pairs of telescoping members being in a telescoping relationship with each



other and threaded fastener means including a threaded shaft slideably disposed through a central portion of said second transverse member and having one end extending into threaded engagement with said tubular member for moving said second assembly with respect to said first assembly whereby rotation of said threaded shaft in one direction causes said first and second abutment members to move toward each other to tighten against the grave marker with equal force and rotation of said threaded shaft in the other direction permits the first and second abutment members to move apart;

means for holding decorative objects; and

means for attaching said decorative object holding means to said saddle whereby decorative objects can be displayed on a grave marker and held up out of the way from lawn movers or the like.

4,640,046

REVOLVING DOOR COLLAPSING MECHANISM

Calvin R. Rushford, Reed City, Mich., assignor to Indal, Inc., Reed City, Mich.

Filed Jun. 18, 1985, Ser. No. 746,236
Int. Cl.[4] E05D *15/02*
U.S. Cl. 49—44 **15 Claims**

1. In a collapsible revolving door comprising:

a central shaft;

upper and lower housing means mounted respectively to upper and lower portions of the central shaft and adapted to be mounted to the ceiling and floor respectively of a building opening;

a plurality of door leaves;

means for mounting each of the door leaves to the upper and lower housing means for rotation therewith about a central vertical axis of the central shaft under normal conditions, but for rotation about a second vertical axis radially offset from the central axis when the door leaves are subject to panic conditions;

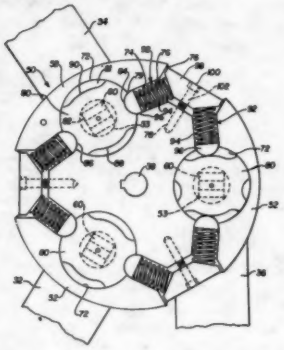
the improvement in the door leaves mounting means comprising:

a cam means mounted for rotation about said second axis within at least one of said upper and lower housing means and nonrotatably connected to each of said door leaves;

said cam means having a substantially vertical peripheral surface and at least one retaining indentation in the peripheral surface;

at least one horizontal bore for each of said cam means in said one housing means in registry with the peripheral surface of said cam means;

at least one resilient detent means mounted in each of said horizontal bores for engaging said at least one indentation



to releasably maintain said cam rotationally fixed in said one housing when said one leaf is radially oriented with respect to said central axis; and

a block movably mounted in said one housing means in abutting relationship with each of said detent means; and

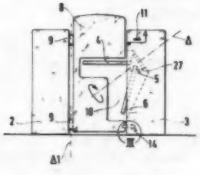
threaded means for adjustably securing said blocks in said one housing to adjust the tension in said resilient detent means.

4,640,047

TWO-WAY PEDESTRIAN ACCESS CONTROL SYSTEM

Marcel Simonin, Bretigny sur Orge; Bernard Garbe, Janville sur Juine, and Alain Carron, Saint Germain les Corbeil, all of France, assignors to Compagnie Generale d'Automatisme CGA-HBS, Paris, France

Filed Apr. 24, 1986, Ser. No. 855,256
Claims priority, application France, Apr. 26, 1985, 85 06405
Int. Cl.[4] E06B *11/08*
U.S. Cl. 49—47 **1 Claim**



1. A two-way pedestrian access control system comprising a passageway laterally bounded by two pillars, said passageway being normally barred by a barrier locked in closed position which can be opened upon validation by a system for recognizing individuals or passes, said barrier comprising a turnstile mounted to one of the pillars and consisting of three arms assembled in conformance with the edges of a regular trihedron and having an axis of rotation confounded with the ternary axis of symmetry of the said turnstile, said axis of rotation being so directed that the turnstile's rotation by $\frac{1}{3}\pi$ about said axis always places an arm in horizontal position, barring the passageway, wherein said barrier further comprises a swinging door, hinged about a vertical axis lieing in the vertical plane

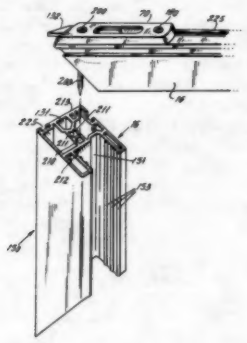
containing the said rotational axis of the turnstile, said door or gate having a cutout enabling passage therethrough of the arms of the turnstile and being high enough to prevent from passing an individual of average size.

4,640,048

WINDOW SASH ASSEMBLY

Kurt W. Winner, 22 Fairmount Ave., Mahwah, N.J. 07430, and Ignazio Cangialosi, 5 Rock Rd., Hawthorne, N.J. 07506

Filed Aug. 6, 1984, Ser. No. 638,129
Int. Cl.[4] E05D *15/22*
U.S. Cl. 49—181 **9 Claims**



1. A window sash comprising at least one pane and having an upper rail, a lower rail and a pair of vertical stiles; each of said rails and stiles being an extruded unit having a plurality of parallel walls sapced from each other in each rail and stile; each of the rails and stiles being mitered to form a miter joint; each of the rails and stiles comprising a generally channel-shaped member having an outer wall normal to the plane of the sash and a pair of the aforementioned parallel walls extending normal to the outer wall;

a further plurality of additional wall members in each of the rails and each of the stiles extending normal to the first-mentioned outer walls and parallel to the first mentioned additional walls secured thereto, said rails and stiles forming a pane support;

an additional spacing and support member at each end of each stile and additional horizontal reinforcing members parallel to the first-mentioned wall of each of the rails; and

a screw at each of the mitered corners passing from the outer surface of each rail through the rail and through the additional horizontal walls and into the end of the adjacent stile; said screw forming its own thread as it penetrates the outer wall of the rail, the spacing and support members within the rail and the boss within the stile; the screw being supported at a plurality of locations coinciding with the walls of the rails perpendicular by the screw along its length in the rail and being supported along at least part of its length in the stile whereby the miter joint integrity is maintained against distorting forces imposed on the sash.

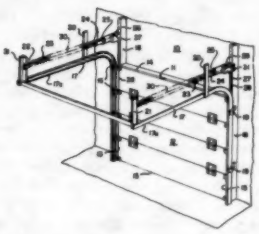
4,640,049

SAFETY DEVICES FOR OVERHEAD GARAGE DOOR SPRINGS

Joseph L. Duncan, 224 Laurie Dr., Pittsburgh, Pa. 15235

Filed Oct. 29, 1985, Ser. No. 792,443
Int. Cl.[4] E05D *15/22*
U.S. Cl. 49—197 **6 Claims**

1. A garage or like door structure having a door opening, a door movable between a closed position and an open position, guide tracks adjacent opposite sides of the door opening, said guide tracks having a vertical section parallel to the sides of the door opening and a horizontal section transverse thereto above the top of the door opening, rollers on the sides of the door moving in said guide tracks to carry the door from a vertical closure position to a horizontal open position above the level of the door opening, a counterblance spring assembly for said door including a coil spring mounted for movement in tension parallel to and adjacent said horizontal guide rail section, anchor means in the garage structure adjacent the horizontal section of the guide tracks and spaced from the door opening, attaching means at each end of the coil spring, one attachement means at one end of the spring engaging said anchor means, a fixed pulley assembly including guide means on the garage structure above the door opening and in general alignment with the anchor means on a line generally parallel to the hori-



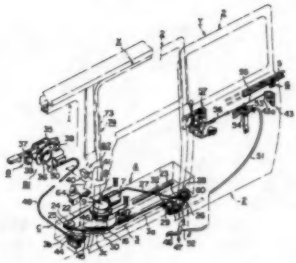
zontal section of the guide rails, movable pulley assemby including guide means connected to the attachment means at the opposite end of the coil spring, lift cable means connecting said movable pulley assembly to the garage door over the fixed pulley, a safety cable extending through the open center of the coil spring and through the guide means of each of the fixed pulley assembly and movable pulley assemly, said safety cable aligned with the fixed pulley and anchor means, said safety cable being anchored at each end to said garage structure and adjusting means at one end of said safety cable for continuously placing the cable under sufficient tension that it will contain each of the coil spring, the fixed pulley assembly and the movable pulley assembly against substantial horizontal and vertical movement in the event of spring breakage.

4,640,050

AUTOMATIC SLIDING DOOR SYSTEM FOR VEHICLES

Jun Yamagishi, and Hiromitu Nishikawa, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Jul. 25, 1985, Ser. No. 759,088
Claims priority, application Japan, Jul. 26, 1984, 59-154105; Aug. 9, 1984, 59-121406[U]
Int. Cl.[4] E05F *15/00*
U.S. Cl. 49—280 **12 Claims**



1. An automatic sliding door system for vehicles which consists of:

(A) a sliding door driving mechanism comprising:
guide means affixed to a body of a vehicle so as to guide wires along a path for opening and closing movements of a sliding door, one ends of said wires being secured to the sliding door;
a winding drum mounted to the body to be rotatable in either direction to send the wires along the guide means, in which another ends of said wires being wound round and outer circumference of said drum and secured thereto; and
a driving motor mounted to the body and operatively connected to said winding drum through a speed reducer and an electromagnetic clutch;
(B) an operating device mounted on the body for operating opening and closing movements of the sliding door;
(C) a door lock releasing device comprising two parts, one of which is mounted on the body and connected to the operating device and another one of which is mounted on the sliding door and connected to a door lock of the sliding door, also comprising coupling means for connecting said two parts mechanically or electrically when the door is closed, and by operation of the operating device said door lock releasing device being actuated to release engagement of the door lock prior to starting operation of the sliding door driving mechanism; and
(D) a control device electrically connected with the driving motor, the electromagnetic clutch and the operating device, and operating to energize the driving motor and the clutch so that the wires are sent in a direction to open the sliding door when the operating device is operated for opening, and also the wires are sent in another direction to close the sliding door when the operating device is operated for closing.

4,640,051

ADJUSTMENT MECHANISM FOR TILTABLE GLAZED SASHES

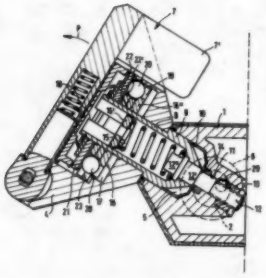
Helmut Maier, Leinfelden-Echterdingen; Ralf Storandt, Leonberg; Heinz Guenther, deceased, late of Leonberg; by Renate Guenther, legal representative, Stuttgart, and by Sabine Guenther, legal representative, Neuenbürg, all of Fed. Rep. of Germany, assignors to Geze GmbH, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,638

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400778

Int. Cl.[4] E05F *11/24*

U.S. Cl. 49—348 **8 Claims**



1. An adjustment mechanism for tiltable glazed sashes of windows and doors and the like, the adjustment mechanism comprising a housing (1) mountable on a frame part associated with a glazed sash, a spindle (2) arranged in said housing, a slider arranged on said spindle, said slider being moveably disposed on said spindle and displaceable upon rotation of said spindle and being operable to be coupled to the glazed sash to tilt the same, a first gear wheel (6) rotatably fixedly connected with said spindle at an end thereof, a second gear wheel (5) in mesh with said first gear wheel and rotatably journalled in said housing, a knob-like rotatable handle (4) for rotating said spindle, said handle being journalled on a stub-like axle element (8) which is rotatably fixedly connected with said second gear wheel, said axle element being constructed as a hollow sleeve, there being a coil spring (15) operable as a latch spring arranged inside said sleeve, a plate part (16) which is axially displaceable and non-rotatably arranged relative to said sleeve, said plate part having a first portion (16″) surrounding the sleeve in ring-like manner and being connected via web parts which extend through axial slots (18) provided in the sleeve with a second portion (16′) of the plate part which is disposed inside the sleeve and which forms a movable abutment for the spring, said spring being braced against an annular step in said sleeve and biased against said movable abutment, latch elements (19) arranged on the first portion (16″) of said plate part, and counter elements (20) on said knob-like handle (4) and a part (22) connected therewith, and a latch mechanism (15 to 23) cooperating with said part (22) and operating as an overload coupling arranged inside said knob-like handle, said stub-like axle element being drivingly connected with said knob-like handle by said latch mechanism, whereby rotation of said handle causes rotation of said spindle and displacement of said slider. .

4,640,052

HINGE BOLT SET

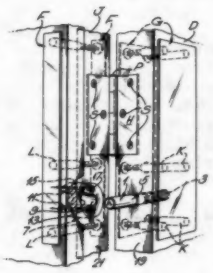
Alan R. Zebedee, New Milton, and Derek R. Hutchins, Christchurch, both of England, assignors to Nouveaux Security Products Limited, Southhampton, England

Filed Feb. 24, 1986, Ser. No. 832,842

Claims priority, application United Kingdom, Feb. 27, 1985, 8505077

Int. Cl.[4] E05D *11/10*

U.S. Cl. 49—383 **9 Claims**



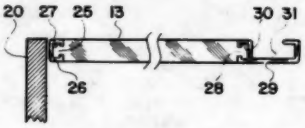
1. A hinge bolt set comprising a rod of circular cross-section adapted to be inserted into an aperture in an edge face of a door to which face hinges are normally connected and a keep adapted to be inserted into an aperture in the jamb of a frame of the door, said keep having a cavity therein extending from a side edge thereof to a central portion thereof so as to permit the rod, during use, to move into and out of said cavity, the inner end of said cavity terminating in an arcuate surface complementary with that of said rod and wherein one of the rod and keep is formed of a synthetic resinous material, and the other of said parts is formed of metal.

4,640,053

EDGE REINFORCED CABINET DOOR WITH BUILT-IN DOOR HARDWARES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Aug. 12, 1985, Ser. No. 764,888
Int. Cl.[4] E06B 3/00
U.S. Cl. 49—501 7 Claims



1. An edge reinforced cabinet door comprising in combination;

(a) a cabinet door;

(b) a first elongated reinforcing member having lengthwise disposed retaining groove with a narrowed-down opening, said first elongated reinforcing member fitted along a first edge of said cabinet door by a sliding method and secured nonslidably to said first edge wherein said first edge includes a lengthwise disposed retaining rail with a cross section substantially matched to the cross section of said retaining groove included in said first elongated reinforcing member;

(c) a second elongated reinforcing member having a lengthwise disposed retaining groove with a narrowed-down opening, said second elongated reinforcing member fitted along a second edge of said cabinet door parallel and opposite to said first edge by a sliding method and secured nonslidably to said second edge wherein said second edge includes a lengthwise disposed retaining rail with a cross section substantially matched to the cross section of said retaining groove included in said second elongated reinforcing member, said second elongated reinforcing member further including a handle groove with an opening open through a plane substantially including one side surface of said cabinet door;

(d) a first hole disposed in one end of said cabinet door substantially perpendicular to said first and second edges substantially through said cabinet door material adjacent to one reinforced corner in the cross section of said edge reinforced cabinet door in a direction substantially parallel to the length of said first elongated reinforcing member wherein said one reinforced corner includes said first elongated reinforcing member and further includes substantially said one side surface of said cabinet door; and

(e) a second hole disposed in the other end of said cabinet door opposite and parallel to said one end substantially through said cabinet door material substantially in line with said first hole and adjacent to said one reinforced corner in the cross section of said edge reinforced cabinet door.

4,640,054

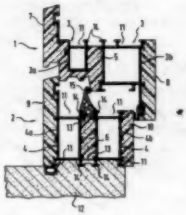
SASHES AND MATCHING FRAMES FOR WINDOWS AND GLASS DOORS

Kurt Breimeier, Wunstorf; Heinrich Eickhoff, Neustadt; Hans-Walter Erdmann, Garbsen, and Hans D. Kühnel, Minden, all of Fed. Rep. of Germany, assignors to Fulgurit GmbH & Co., Kommanditgesellschaft, Wunstorf, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 692,966
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402226
Int. Cl.[4] E06B 1/04
U.S. Cl. 49—504 10 Claims

1. A composite shaped section for sashes or jambs for windows or glazed doors and comprising in its installed state:

(a) first and second aluminum hollow shaped sections each of which has an outer vertical surface, an inner vertical surface, a top horizontal surface and a bottom horizontal surface;



(b) each of said aluminum hollow shaped sections having a given plastic coating material covering said outer surfaces; and

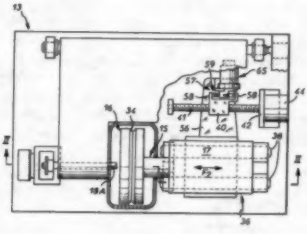
(c) a thermal separation between said inner surfaces consisting of said given plastic coating material.

4,640,055

GRINDING MACHINE FOR GUIDED OR NON-GUIDED BEVELING OR GROOVING OF AN OPHTHALMIC LENS

Suzan Badin, Paris; Jean-Francois Moulin, Ris-Orangis; Luc Delattre, Pont Ste-Maxence, and Patrice Renan, Paris, all of France, assignors to Essilor International Cie Generale d'Optique, Cretel, France

Filed Sep. 6, 1985, Ser. No. 773,056
Claims priority, application France, Sep. 11, 1984, 84 13906
Int. Cl.[4] B24B 9/08
U.S. Cl. 51—101 LG 8 Claims



1. Machine for beveling or grooving an ophthalmic lens, said machine comprising, at a machining station, a frame, a first support shaft, means mounting said first support shaft on said frame for rotation, at least one beveling or grooving grinding tool on said first support shaft, a motor forming means for driving said first support shaft, a rotatable second support shaft, means mounting said second support shaft on said frame parallel to said first support shaft and for rotation, said second support shaft having means for axially gripping an ophthalmic lens for edgewise contact of such lens with said beveling or grooving grinding tool, at least one of said support shafts being a mobile support shaft, and carried on a support member for movement relative to said frame and parallel to the axis of said mobile support shaft, displacement means for procuring guided displacement of said mobile support shaft parallel to its axis comprising a drive member, selectively engageable coupling means arranged between said mobile support shaft and said displacement means, said coupling means comprising two spaced flanges disposed transversely relative to the axis of said mobile support shaft and fastened to a selected one of said support and drive members, and abutment means disposed between said flanges carried by the other of said drive and support members, said abutment means being movable gener-

ally perpendicularly to said flanges between a disengaged position in which said abutment means are out of engagement with said flanges for uncoupling said mobile support shaft from said displacement means and an engaged position in which said abutment means are braced between said flanges for coupling said mobile support shaft with said displacement means.

4,640,056

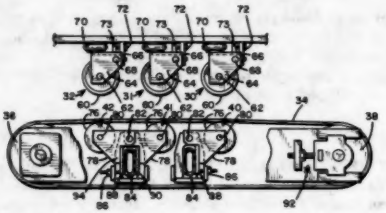
VERTICALLY SELF-CENTERING FEED ASSEMBLY

Lee E. Stump, Brooklyn Park, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

Continuation of Ser. No. 507,353, Jun. 24, 1983, abandoned. This application Apr. 11, 1985, Ser. No. 722,117

Int. Cl.[4] B24B *21/04*

U.S. Cl. 51—138 **5 Claims**



1. In a work station having upper and lower rigid frame members spaced apart from one another to define a path for incoming workpieces such that the incoming workpieces may pass along a longitudinal axis extending therebetween, a feedworks assembly comprising:

(a) at least two pairs of opposed pinch wheel assemblies being disposed along the longitudinal path of said incoming workpieces with one member of each pair of pinch wheel assemblies being disposed above said longitudinal path and with the other member of the pair being disposed beneath said path so as to define a workpiece support plane generally midway between the opposed members of each pair, and with each member of each pair comprising a plurality of pivotally mounted floating support wheels, each support wheel adapted for rotation about a wheel rotation axis and being arcuately rockable about a rocking axis to oscillate generally arcuately about said rocking axis and inwardly toward the surface of said incoming workpiece and being coupled to each of said upper and lower frame members in generally opposed relationship;

(b) air bladder means mounted on said frame members for exerting a controlled resilient biasing force upon each floating support wheel while said support wheel is in engagement with said incoming workpieces;

(c) a drive conveyor coupled to said lower frame member and comprising a driven roller, an adjustable idler roller for varying the tension of an endless belt trained thereover, and an endless conveyor belt being trained over said driven roller and idler roller and having an upper flight portion passing over each of the pinch wheel assemblies disposed beneath said longitudinal path; and

(d) a transversely extending support shaft disposed coincidentally with and defining each of said rocking axes and spaced laterally from each said wheel rotation axis for accommodating independent rockable arcuate motion of the wheel rotation axis of each of said support wheels, so as to provide resilient opposed upper and lower rotatable supports for workpieces being carried on said conveyor belt while moving therealong with the center planes of said workpieces being movably disposed along a relatively constant horizontal center plane in response to opposed forces being exerted upon said workpieces by said support wheels, and with said support wheels being adapted to be deflected in a direction toward and away from the horizontal plane of said moving workpiece upon encountering and engaging irregularities in the surfaces and thicknesses of said workpieces adjacent to said support wheels without affecting the vertical disposition of said workpieces; the support wheels of two adjacent ones of said pinch wheel assemblies disposed beneath said path being mounted with respect to the same one of said transverse support shafts and spaced apart from said one transverse support shaft in opposite longitudinal directions.

4,640,057

DRESSING-GRINDING PROCESS AND ELECTRONICALLY CONTROLLED GRINDING MACHINE

Ernst Saljé, Steintorwall 12, 3300 Braunschweig, Fed. Rep. of Germany

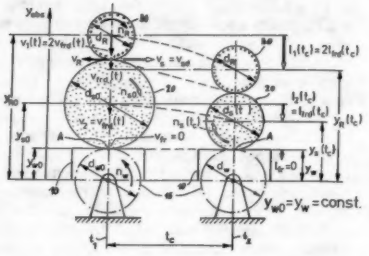
PCT No. PCT/EP83/00145, § 371 Date Jan. 26, 1984, § 102(e) Date Jan. 26, 1984, PCT Pub. No. WO83/04322, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 6, 1983, Ser. No. 589,096

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221397

Int. Cl.[4] B24B *53/00*

U.S. Cl. 51—165.87 **17 Claims**



10. A grinding machine for grinding a workpiece to a predetermined profile comprising:

a frame;

a grinding wheel mounted on a grinding wheel carrier supported by said frame and movable with respect thereto;

a dressing roller mounted on a dressing roller carrier supported by said frame and movable with respect thereto;

controllable drive motor means for rotating said grinding wheel and said dressing roller;

control means for controlling said motor;

means for measuring the dimension of the workpiece parallel to the radius of said grinding wheel;

means for determining the height of the axis of the grinding wheel above said workpiece;

logic means for determining the diameter of the grinding wheel from dimension of the workpiece, the position of the grinding wheel, and from the computed diameter of the dressing roller for controlling the movement of the said dressing roller toward said grinding wheel.

4,640,058

PORTABLE BLADE SHARPENER

Louis S. Glesser, P.O. Box 800, Golden, Colo. 80401

Filed Sep. 30, 1985, Ser. No. 781,722

Int. Cl.[4] B24B *3/54*

U.S. Cl. 51—211 R **1 Claim**

1. A blade sharpening apparatus comprising:

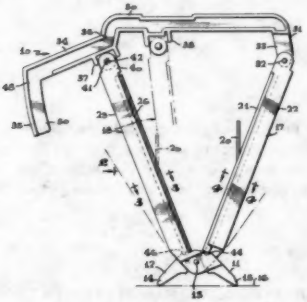
a base;

a pair of elongated sharpening elements carried on said base pivotally connected to each other at adjacent ends and free at their opposite ends;

an elongated handle means having one end pivotally at-

tached to said free end of a selected one of said sharpening elements and having a second free end;

detachable means on said handle means between said ends thereof cooperating between said handle means and the free end of said other sharpening element for releasable securement therebetween whereby said sharpening elements are disposed between an operable position and a storage position such that said sharpening elements are adjacent to one another in said storage position and separated in a V-shaped configuration in said operable position;



said handle means and said releasable securement means define a detachable retainer;

said base having a pair of legs for supporting the apparatus when in said operable position, each leg integral with and extending from a respective sharpening element, said legs joined together by a pivot constituting said pivotal connection

said second free end of said handle means having a releasable securing means cooperating with at least one of said legs to secure said sharpening elements adjacent each other when in said storage position.

4,640,059

APPARATUS FOR GRINDING THE KNIVES IN TOBACCO CUTTING MACHINES

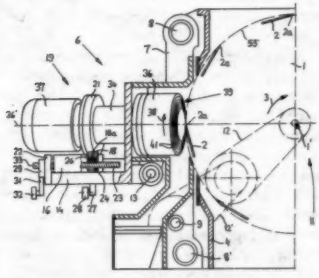
Werner Komossa, Börnsen; Nikolaus Häusler, Wohltorf, and Uwe Elsner, Dassendorf, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,266

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409266

Int. Cl.⁴ B24B *19/00, 53/07*

U.S. Cl. 51—5 D **20 Claims**



1. In a machine for cutting tobacco and like fibrous materials, a rotary knife holder; at least one knife having a cutting edge and being mounted on said holder; first drive means for rotating said holder about a first axis whereby said cutting edge orbits along a circular first path; a mobile support; guide means defining for said support a second path for movement in parallelism with said axis; a grinding wheel mounted on said support for rotation about a second axis, said wheel having a grinding surface with annular undulations concentrically surrounding said second axis and said surface being adjacent to said first path during movement of said support along said second path; second drive means for reciprocating said support along said second path in first and second directions between first and second end positions and for moving said support at a speed which is a function of the rotational speed of said holder, at least while said support moves in said first direction, said support assuming said second end position upon completion of movement in said first direction; first displacing means for shifting the grinding wheel away from said holder when the support reaches or approaches said second end position so that the grinding wheel is out of contact with the cutting edge during movement of the support from the second to the first end position; and second displacing means for shifting the grinding wheel toward the holder when the support reaches or approaches said second end position so as to move said grinding surface closer to said circular path.

4,640,060

HAND HELD SANDING DEVICE

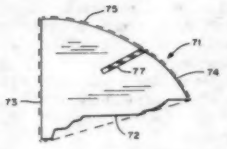
Sergei G. Lukianoff, 2107 Van Ness Ave., San Francisco, Calif. 94109

Continuation-in-part of Ser. No. 454,608, Dec. 30, 1982, Pat. No. 4,501,096. This application Feb. 25, 1985, Ser. No. 705,505

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.⁴ B24B *29/02*

U.S. Cl. 51—391 **6 Claims**



1. An improved hand-held sanding device for use with sandpaper or other abrasive sheet material comprising

a resilient block having laterally extending intersecting faces forming block perimeter surfaces about which said abrasive material can be wrapped, said perimeter surfaces comprising a bottom and side surface, and a top surface extending in a convex curvature from said bottom surface upwardly to said side surface, the intersection of said top, bottom and side surfaces forming three laterally extending block edges,

at least one of said bottom or side surfaces having a contour adapted to a specialized sanding surface, and

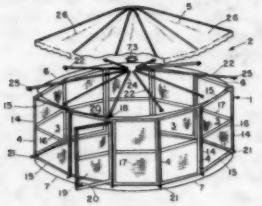
said convex top surface having a receiving slot formed therein intermediate and substantially parallel to the laterally extending edges of said curved top surface, said receiving slot being of a width to snuggly receive two ends of abrasive sheet material tightly wrapped around the block perimeter surface to hold same in its tightly wrapped position.

4,640,061

ROLL-FORMED FRAME FOR PORTABLE ENCLOSURES

Richard L. Trumley, Charlotte, Mich., assignor to General Aluminum Products, Inc., Charlotte, Mich.

Filed Jun. 2, 1980, Ser. No. 155,466
Int. Cl.[4] E04B *1/346*
U.S. Cl. 52—71 **22 Claims**



1. In a collapsible shelter comprising a series of wall panels with flexible hinges interconnecting the same along their upright edges; said wall panels being arranged in a closed polygon configuration and supporting a roof to form an enclosure, and including at least one fastener cable with retainers to hold said wall panels and said roof in position, the improvement wherein:

said wall panels comprise roll-formed frame segments interconnected to form the margin of said wall panels; said frame segments including a roll-formed channel disposed in an outer, peripheral edge thereof; said channel having a dovetailed shape adapted to interchangeably receive and retain therein a bead portion of said hinges, said fastener cable, and a body portion of said retainers;

said wall panels have a substantially rectangular shape, and include a pair of side frame segments, and top and bottom frame segments;

said hinge bead is disposed in the channels in said side frame segments;

said fastener cable is disposed in the channel of one of said top and bottom frame segments;

said retainers are positioned in the ends of those frame segments in which said fastener cable is disposed;

said roll-formed frame segments include a pair of spaced apart sidewalls disposed adjacent opposite sides of said channel and formed integrally therewith;

said channel and said frame sidewalls form a pair of wedge-shaped slots on either side of said channel in the interior of said frame segment; and

said retainers include a body with a pair of wedge-shaped prongs which are matingly received into said slots at the ends of those frame segments in which said fastener cable is disposed.

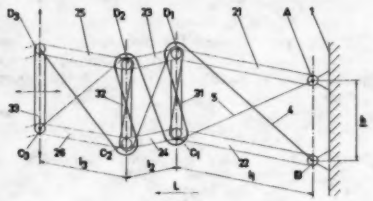
4,640,062

FRAMEWORK TRUSS WITH VARIABLE CANTILEVER LENGTH

Erno Rubik, Budapest, Hungary, assignor to Kozponti Valto-es Hitelbank Rt., Budapest, Hungary

PCT No. PCT/HU83/00055, § 371 Date Jun. 28, 1985, § 102(e) Date Jun. 28, 1985, PCT Pub. No. WO85/01865, PCT Pub. Date May 9, 1985
PCT Filed Oct. 31, 1983, Ser. No. 760,725
Int. Cl.[4] E04H *12/18*; A47F *5/08*
U.S. Cl. 52—109 **11 Claims**

1. A lattice bracket of variable cantilevered length, said bracket having an articulated lattice structure for fastening articulately at two fixed points on a wall or other support, said lattice structure comprising at least two parallelogram-like articulated lattice fields, each lattice field consisting of two parallelly disposed links and of a spacer, said spacer having a length equal to the distance between said two fixed pivot points, and joining together in pairs the ends of the two links between pivots, said lattice fields being disposed in tandem continuously in a direction away from said fixed pivot points, and at least one substantially elongation-free cable connecting



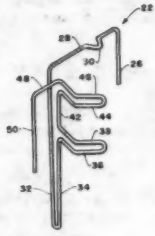
at least one of said fixed pivot points to the diagonally opposite pivot of the last spacer of the last articulated lattice field said cable running along like-leaning diagonals of the articulated lattice fields, and between said fields running along the respective spacer.

4,640,063

REINFORCING BAR SUPPORT CLIP

Henry Ayala, 605 Broussard Dr., Thousand Oaks, Calif. 91360

Filed Aug. 13, 1985, Ser. No. 765,140
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—127.3 **2 Claims**



1. In combination with an elongated form, said elongated form being fixedly positioned at a particular location, said elongated form having a top surface, a cavity located directly adjacent said elongated form, said cavity to have cement poured therein, a reinforcing bar located within said cavity prior to pouring of said cement, a portion of said reinforcing bar extending exteriorly of said cement, a support clip for mounting said portion of said reinforcing bar onto said elongated form prior to pouring of said cement, said support clip comprising:

an integral wire member defining a front section and a rear section, said rear section including engaging means, said engaging means for fixedly mounting said wire member onto said elongated form;

said front section including a pocket, said reinforcing bar to be located within said pocket, said pocket exerting a continuous bias tending to hold said reinforcing bar tightly against said elongated form, said front section including a handle member, said handle member being manually operable to move said pocket a greater distance from said elongated form permitting locating of and removal of said reinforcing bar from said pocket;

said engaging means comprising a U-shaped section, said U-shaped section to be slipped over said elongated form and tightly engage therewith;

said pocket being defined by a pair of spaced apart leg members; and

said rear section further including an orientation tab, said orientation tab being abuttingly located against said top surface of said elongated form thereby automatically orienting said wire member at the proper position when engaged with said elongated form.

4,640,064

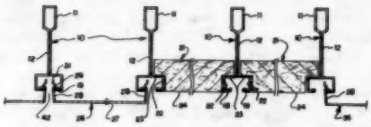
SUSPENSION CEILING SYSTEM COMBINING SNAP-UP PANS AND LAY-IN PANELS

John P. Goodworth, II, Medina, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Continuation-in-part of Ser. No. 713,275, Mar. 18, 1985, abandoned. This application Dec. 2, 1985, Ser. No. 803,729

Int. Cl.⁴ E04B *1/82*

U.S. Cl. 52—145 **14 Claims**



1. A suspension ceiling comprising a grid formed of runners each providing a bulb, a central web depending from said bulb, a pair of flanges along the edge of said web remote from said bulb extending laterally in opposite directions therefrom, and a pair of inwardly extending laterally spaced lips on the side of said flanges remote from said web, said runners being interconnected in said grid and cooperating to define a plurality of openings, lay-in panels in some of said openings supported along the periphery thereof by associated flanges, and snap-up pans in some of said openings providing upstanding peripheral lock means extending past associated of said lips, said lock means supporting said pans from said associated lips, adjacent edges of adjacent pans being spaced from each other so that racking of said grid does not produce corresponding racking of said pans.

4,640,065

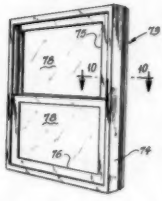
STRUCTURAL MEMBER

Ronald R. Harris, and Russell L. Ault, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 7, 1985, Ser. No. 785,192

Int. Cl.⁴ E06B *1/04*; E04C *1/00*

U.S. Cl. 52—204 **24 Claims**



1. A lineal structural member comprising an elongate glass wool core particularly formed as one of a plurality of cores provided by the cutting of an elongate binder-containing glass wool board of predetermined thickness longitudinally into a plurality of glass wool cores of a predetermined cross-sectional size, said core having outer longitudinal portions removed to provide the core with a predetermined cross-sectional shape, outer surface portions all the way around the periphery of the core being impregnated with a hardenable liquid resin in addition to the binder and the resin being cured, and a separately applied and cured hardenable liquid resin casing surrounding and being integral with and bonded to the resin-impregnated outer surface portions of the core.

4,640,066

VEHICLE WINDOW STRUCTURE

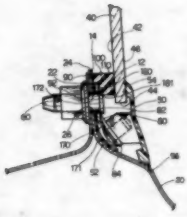
Motomu Hayashi, Okazaki; Masayuki Nagai, Aichi, and Shigeru Akoshima, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 30, 1985, Ser. No. 739,388

Claims priority, application Japan, Jun. 11, 1984, 59-86555[U]

Int. Cl.⁴ E06B *3/00*

U.S. Cl. 52—208 **12 Claims**



1. A sealing assembly for attachment to a window glass prior to insertion within a window opening of a vehicle body, said assembly comprising:

a retainer having a flange;

a window molding secured to said flange, said window molding having a first edge and a second opposite edge, each edge having an inner surface;

a seal member secured to said retainer, said seal member including a sealing portion and a packing portion extending from the sealing portion, said sealing portion having an inner surface and an outer surface opposing said inner surface of said first edge of said window molding and defining a space therebetween for receiving a peripheral edge of said window glass such that said inner surface of said first edge contacts an outer surface of said window glass, and said outer surface of said seal member contacts an inner surface of said window glass; and

fastening means on said retainer for securing said window glass to said vehicle body after said retainer, window molding and seal member are attached to said window glass, said packing portion of said seal member being located between said fastening means and said vehicle body.

4,640,067

FLOOR BOARD ASSEMBLY

Franz-Josef Hagemann, Eichendorffweg 8, and Bernd Hewing, Hellstiege 10, both of 4434 Ochtrup, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,818

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318694

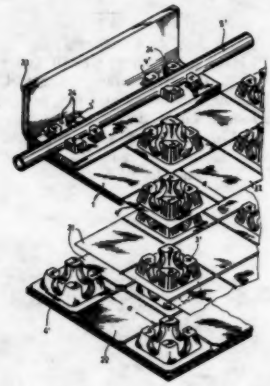
Int. Cl.⁴ E04B *5/48*

U.S. Cl. 52—220 **10 Claims**

1. A plate for the assembly of a floor covering on which pipes of a floor heating system can be installed, comprising:

an abrasion-proof molded cover foil of relatively tough synthetic material, said cover foil having a plurality of equispaced one-piece molded hollow holding devices, each formed with four upwardly projecting and opposing clamping fingers, for securing the pipes therebetween, said clamping fingers having ribs formed on outer sides thereof for stiffening backs of said clamping fingers, and

an insulation sheet of synthetic foam material installed directly under the cover foil, said insulation sheet having protruding insertion parts which can be inserted into the hollow holding devices of the cover foil,



whereby the cover foil and the insulation sheet are at least held together provisionally by inserting the insertion parts of the insulation sheet into the hollow holding devices of the cover foil.

4,640,068

ANCHORING AND COUPLING DEVICE FOR TENDONS IN PRESTRESSED CONCRETE

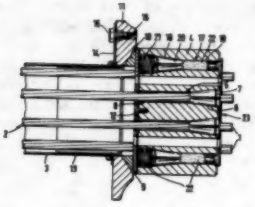
Dieter Jungwirth, and Also Mannhart, both of Munich, Fed. Rep. of Germany, assignors to Dycherhoff & Widmann Ag, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 510,077

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224702

Int. Cl.[4] E04C *5/08, 3/26;* F16G *11/00*

U.S. Cl. 52—223 L 6 Claims



1. Anchoring device for a prestressing location also serving as a coupling location for prestressing tendons in a prestressed concrete structure with the tendons made up of a plurality of individual elongated elements such as strands, wires and the like, said tendons being bonded to the concrete structure subsequent to prestressing, said anchoring device comprising an anchoring member having a first face surface and a second face surface each facing in an opposite direction and disposed in spaced relation with a circumferentially extending side surface extending transversely of, around and between said first and second face surfaces, said anchoring member arranged to be supported against an abutment member, said anchoring member having a plurality of axially extending first and second bores therein with said first bores extending into said anchoring member from said first face surface to said second face surface and said second bores extending from said second face surface toward said first face surface, wedges positioned within said first and second bores for anchoring individual elements within said first and second bores, said first and second bores are shaped in the axial direction thereof for receiving said wedges therein, a first plate extending across said face surface and covering said first bores in said first face surface, means connecting said first plate to said anchoring member, spring elements in said first bores and bearing against said first plate and against said wedges in said first bores, wherein the improvement comprises that said wedges have a frusto-conical configuration, each said first and second bore has an axially extending frustoconical section corresponding to the frusto-conical configuration of the wedges and an axially extending generally cylindrical section extending axially from the smaller diameter end of said frusto-conical section, said frusto-conical sections in said first bores being located adjacent said first face surface and said cylindrical sections in said first bores extending from the small diameter end of said frustoconical sections approximately to said second face surface and said frusto-conical sections in said second bores being located adjacent said second face surface and said cylindrical section in said second bores extending from the smaller diameter end of said frusto-conical sections approximately to said first face surface with the axial dimensions of said first and second bores between said first and second face surfaces being such that said frusto-conical sections in said first bores are located wholly in the axially extending region of said cylindrical sections in said second bores and are spaced axially from said frusto-conical sections in said second bores, a permanently plastic lubricating corrosion protection material is filled into said first bores, said first and second bores are uniformly distributed over the cross-section of said anchoring member transverse to the direction between the first and second face surfaces thereof, and a second plate on the second face of said anchoring member and forming a cover over said first bores containing said corrosion protection material, said second plate being removably secured to said anchoring so that it can be removed for the subsequent placement of individual elements into said first bores containing said corrosion protection material.

4,640,069

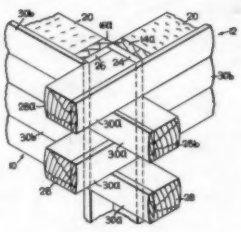
METHOD AND APPARATUS FOK CONSTRUCTION OF BUILDINGS TO GIVE THE APPEARANCE OF FULL LOG CONSTRUCTION

Theodore P. Felser, Winter, Wis., assignor to Felser Forest Products, Inc, Winter, Wis.

Filed Apr. 14, 1986, Ser. No. 851,587

Int. Cl.[4] E04B *1/10*

U.S. Cl. 52—233 7 Claims



1. Apparatus for construction of buildings to give the appearance of full log construction, comprising:

a first wall section comprising studs including at least one end stud located near one end thereof, and having wall finishing materials attached to the inside of said studs;

a second wall section also comprising studs including at least one end stud located near one end thereof, and having wall finishing materials attached to the inside of said studs, said first and second walls being assembled together at approximately right angles to each other such that said

end stud of said first wall contacts said end stud of said second wall at approximately right angles to form a V which opens toward the outside of the building;

a corner block assembly, having two studs assembled perpendicular to each other and arranged vertically so as to fit against said end studs of said first and second wall sections, and having log blocks arranged horizontally and attached at one end thereof alternately perpendicular to first one and then the other of said two studs;

siding, having a cylindrically convex outer surface, horizontally applied to the outside of said studs, having a vertical dimension approximately the same as that of said log blocks, and applied coextensively with said log blocks.

4,640,070

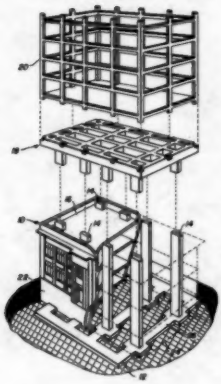
METHOD OF ADDING EXTRA FLOORS ON EXISTING BUILDINGS

Ian Moffat, 71 Amelia Street, Hamilton, Ontario, L8P 2V3, Canada

Filed Mar. 21, 1986, Ser. No. 842,572

Int. Cl.[4] E04B *1/00, 1/35*

U.S. Cl. 52—236.3 **15 Claims**



6. A building structure comprising:

an existing building structure, said existing building structure having existing foundations, walls supported on said existing foundations said wall defining a building perimeter, and a roof located above said walls, and an additional internal building foundation adjacent said existing foundation;

a plurality of internal support columns mounted on said additional internal foundations, said plurality of internal supporting columns extending above said existing structure to a predetermined height;

a platform truss supported on said internal support columns above said existing building structure, said platform truss being proportioned to support an additional building structure with a plurality of floors above said existing building structure;

an construction skeleton framework supported on said platform truss, said skeleton framework providing a plurality of floors above said existing building structure.

4,640,071

INTERLOCKING BUILDING BLOCK

Juan Haener, 8215 Harton Pl., San Diego, Calif. 92123

Filed Jul. 12, 1985, Ser. No. 754,136

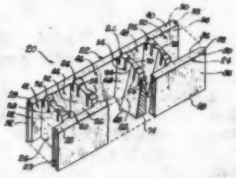
Int. Cl.[4] E04C *1/08, 1/10, 1/30*

U.S. Cl. 52--286 **30 Claims**

1. An improved interlocking block for a mortarless wall assembly in which a plurality of such blocks are interlocked together to create a substantially continuous planar wall surface having a plurality of stacked linear courses of such blocks bonded together internally by cementitious bonding material, the blocks in each course being mechanically interlocked in end to end relation, with adjacent blocks on the same course, the blocks in a given one of said courses being mechanically interlocked in a staggered relation to the blocks in the abutting courses in said stack, said blocks comprising:

(a) a pair of spaced, parallel, upright sidewalls having flat top and bottom surfaces, said sidewalls having block-interlocking means on opposed ends thereof; and

(b) at least one transverse upright support web spanning said sidewalls and integral and defining a cavity therewith for receiving said cementitious material therein, said web having a concavity disposed at the upper end of one side



thereof and a complimentary convexity disposed at the lower end of said one side, said convexity uniformly sloping upwardly into said concavity, the opposite side of said web sloping upwardly toward said one side, said web is shaped for facilitating release of said block from its forming mold for reducing mold wear thereby and to provide an increased surface area for improving adhesion of said cementitious bonding material thereto when poured into the cavities of said blocks when said blocks are stacked to form said continuous planar wall surface, the upper surface of said web is divided by parallel slits into three separate knockoff portions any one of which can be removed to permit the addition of reinforcing bars extending longitudinally through the block of each course while maintaining the block of abutting courses in their mechanically interlocked relationship.

4,640,072

MULTIPART THERMALLY INSULATED METAL PROFILE FOR FACADE STRUCTURES OR ROOF STRUCTURES

Manfred Mühle, Tulpenstr. 11, DE-4972 Löhne 2, Fed. Rep. of Germany

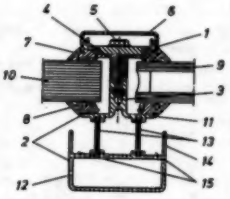
PCT No. PCT/DE85/00031, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/03733, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 6, 1985, Ser. No. 793,697

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406722

Int. Cl.[4] E04B *1/62*

U.S. Cl. 52—403 **6 Claims**



1. A multipart thermally insulated metal profile for facade

structures or roof structures, comprising: an exterior profile member and an interior profile member; insulator means connecting said inner profile member and said exterior profile member; covering panels comprised of glass or other materials held between said exterior profile member and said interior profile member with interposition of sealing means; screw means penetrating said exterior profile member and fastening said insulator means to said exterior profile member, said insulator means extending into said interior profile member; said interior profile member comprising further a contact profile member for said covering panels and a screening profile member oriented parallel thereto at an interval on a room side; insulating bars connecting continuously said contact profile member and said screening profile member in longitudinal direction of said profile members, said insulating bars being anchored in respective grooves in said profile members.

4,640,073

FLOOR PLATE

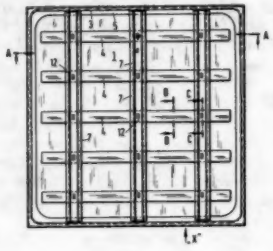
Peter Blecher, Hagen, Fed. Rep. of Germany, assignor to Ermossa AG, Chur, Switzerland

Filed Feb. 3, 1986, Ser. No. 825,792

Claims priority, application European Pat. Off., Feb. 2, 1985, 85101111.4; Dec. 17, 1985, 85116090.3

Int. Cl.[4] E04F *15/024*

U.S. Cl. 52—403 **17 Claims**



1. A floor plate adapted to accommodate a filler material, comprising:

a pan having a base plate and a frame, said base plate extending in a plane and having a plurality of ribs extending parallel to one another and projecting from said plane; said frame extending integrally from the base plate along a perimeter thereof and in the same direction as the ribs;

a plurality of reinforcing rails extending parallel to one another and perpendicularly to the ribs; each said rail being fastened to a plurality of said ribs; and

a channel formed along a free circumferential edge of the frame; the channel being open in a direction toward said plane.

4,640,074

CONCRETE BUILDING UNIT OF A SANDWICH STRUCTURE AND A TRUSS ELEMENT AND AN INSULATING PLATE FOR SUCH A BUILDING UNIT

Ilmari Paakkinen, Savonlinna, Finland, assignor to Oy Partek AB, Parinen, Finland

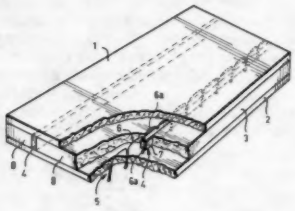
Filed Sep. 4, 1985, Ser. No. 772,393

Claims priority, application Finland, Sep. 10, 1984, 843531

Int. Cl.[4] E04C *2/34*

U.S. Cl. 52—410 **13 Claims**

1. A concrete building unit of sandwich structure comprising: two concrete slabs positioned in parallel at a distance from each other; an insulating layer filling the space between the concrete slabs; and wire trusses having truss wires extending through the insulating layer and fastened to the concrete slabs at opposite edges of the trusses, characterized in that a continuous truss wire of at least one wire truss is stitched through the insulating layer in the shape of a sewing thread in such a manner that the truss wire forms loops protruding from two opposite surfaces of said layer into the respective concrete slab.



4,640,075

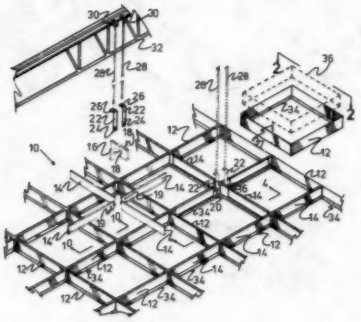
CONTAMINANT SEALING SYSTEM AND METHOD

Theodore Nuncio, 1405 S. Olathe Way, Aurora, Colo. 80017

Filed Jan. 13, 1986, Ser. No. 818,204

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—484 **28 Claims**



1. A contaminant sealing system for a building, comprising:

(a) a plurality of ceiling tile frames having sides and corners;

(b) a plurality of ceiling tiles having a top portion and a bottom portion positioned within the plurality of ceiling tile frames;

(c) mating means, associated with each frame and ceiling tile, for attaching the plurality of ceiling tiles to the plurality of ceiling tile frames;

(d) sealing means, associated with the ceiling tile frames, for preventing contaminants from passing between each of the plurality of ceiling tile frames;

(e) a plurality of X-shaped braces positioned partially over the sealing means and fixedly attached to the corners of the plurality of ceiling tile frames to prevent contaminants from passing between the plurality of ceiling tile frames and to reinforce the contaminant sealing system;

(f) a plurality of height adjustment brackets attached to the plurality of X-shaped braces;

(g) a plurality of threaded rods having two ends and positioned at one end within the plurality of height adjustment brackets and fixedly attached thereto;

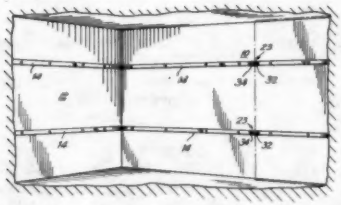
(h) a plurality of beam clamps attached to the plurality of threaded rods at the end of the threaded rods opposite to the plurality of brackets and fixedly attached thereto; and

(i) whereby the plurality of beam clamps are attached to an overhead ceiling joist thereby providing a suspended ceiling which allows containment of contaminants within an area above the ceiling system.

4,640,076
ASSEMBLY SYSTEM WITH CLIP FOR INSTALLING MARBLE PANELS

Neil Migliore, 234 New York Ave., Huntington, N.Y. 11743

Filed Aug. 8, 1985, Ser. No. 763,524
Int. Cl.[4] E04B 2/92, 1/38
U.S. Cl. 52—509 11 Claims



1. A system for assembling and attaching marble panels substantially flush to a flat surface to give the appearance of marble slabs or surfaces, said system comprising:

a plurality of marble panels,

each marble panel including a marble sheet and a coextensive backing layer attached thereto which is routed out adjacent said marble sheet at selected portions thereof to define thin sections spaced from said marble sheet at said selected portions,

independent and separate fastening strips attached to said flat surface, said fastening strips attached on said surface at preselected heights,

a plurality of clips adapted to be secured to said fastening strips for laterally aligning said marble panels on said flat surface;

each clip including an inner leg, an outer leg spaced-apart and parallel to said inner leg, and a transverse web interconnecting said inner and outer legs in a spaced-apart and parallel arrangement to define a guide channel, said guide channel receiving said panels in a non-load bearing manner to laterally align said marble panels;

said inner leg of each clip being secured to said fastening strips at an orientation substantially parallel to the horizontal such that each said guide channel laterally guides the marble panels with respect to each other such that vertical edges of adjacent panels are in abutment and substantially co-planar;

wherein the spacing between respective portions of said common inner and outer legs of each clip which define (of) said guide channel said legs to be freely inserted in the backing layer of said panels to eliminate bending of the outer common leg of the clip.

4,640,077
CLIP FOR A SUSPENDED CEILING

Stephen Hall, London, England, assignor to Intalite International N.V., Curacao, Netherlands

Filed Jan. 23, 1984, Ser. No. 572,891
Claims priority, application United Kingdom, Jan. 21, 1983, 8301605; Mar. 17, 1983, 8307384; Oct. 6, 1983, 8326733
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—665 12 Claims

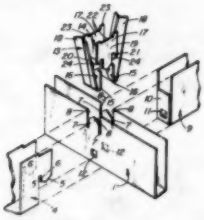
1. A suspended ceiling formed of a grid of elongated ceiling members with spaces therebetween, said ceiling members having an opening therein defined by margin ceiling members, said margin ceiling members each extending in a longitudinal direction and having spaced-apart upstanding walls;

panel ceiling members extending between said margin ceiling members with ends of said panel ceiling members abutting said walls of said margin ceiling members which face the opening defined by said margin ceiling members, at least one of said panel ceiling members having means on at least one end thereof for engaging a clip;

a clip having bridge portion means for spanning the space between said spaced-apart upstanding walls of one of said margin ceiling members;

means on said bridge portion means for limiting movement of said clip along the spaced-apart upstanding walls of said ceiling margin member in a direction perpendicular to the longitudinal direction of said margin ceiling member;

a pair of retaining portions, extending from said bridge portion means, for fitting along said spaced-apart upstanding walls of said margin ceiling member, at least one of said retaining portions having first detent means for removably securing said clip engaging means of one of said panel ceiling members to thereby hold said panel ceiling member against said margin ceiling member, said at least one of said retaining portions being movable and biased towards the other of said retaining portions; and

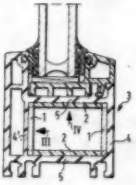


securing means on said clip for removably engaging second detent means on said margin ceiling member and for preventing movement of said clip with respect to said margin ceiling member.

4,640,078
COMPOSITE BAR

Dieter Haffer, Pirmasens-Gersbach, Fed. Rep. of Germany, assignor to Gebruder Kommerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,560
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407639
Int. Cl.[4] E06B 9/17
U.S. Cl. 52—731 14 Claims



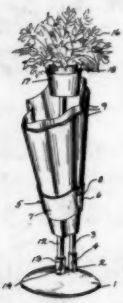
1. In a composite bar, in particular for window frames or sashes, door frames and shutter, comprising a plastic hollow profile bar and an inner reinforcing bar which is inserted in the cavity of said hollow profile of said plastic bar after said plastic bar is formed, which bears on two opposite sides of said plastic hollow profile bar and which comprises in the vicinity of each of said sides a flange, the two flanges being connected together in a force-transmitting manner, the improvement that the two opposite flanges of the reinforcing bar consist of metal and are connected to each other non-metallically by at least one plastic bridge for transmitting forces, especially shear forces, between said two opposite metal flanges, said at least one plastic bridge engaging directly the opposite metal flanges.

4,640,079

DEVICE FOR PACKAGING PLANTS

Matthew A. Stuck, Menasha, Wis., assignor to Modern Mfg. Co. Inc., Menasha, Wis.

Filed Nov. 20, 1985, Ser. No. 800,030
Int. Cl.[4] B65B 67/08
U.S. Cl. 53—390 8 Claims



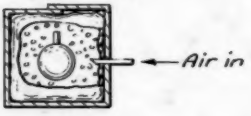
1. A device for packaging potted plants, comprising a base, a column extending upwardly from the base, a tubular support member mounted on the column, said support member being generally frustoconical in shape and having a side wall tapering downwardly and inwardly and having a pair of open ends, said support member disposed to support at least one open-ended tapered sleeve, a pedestal extending upwardly from the base and extending through said support member and through said sleeve, and a platform mounted on the upper portion of said pedestal and located above said support member, said sleeve being drawn upwardly from the support member around said plant supported on the platform to enclose said plant in said sleeve.

4,640,080

PROCESS TO FORM GENERALLY RIGID CUSHION PACKAGES FROM LOOSE FILL DUNNAGE

Donald R. Wright, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 29, 1985, Ser. No. 803,025
Int. Cl.[4] B65B 23/00
U.S. Cl. 53—449 12 Claims



1. A process to form a generally rigid package from loose fill dunnage, the steps of the process comprising:

(a) providing a first packaging enclosure capable of being sealed and withstanding a degree of internal pressure without substantial expansion;

(b) providing a generally flexible, easily deformable second packaging enclosure having an internal volume greater than that of the first packaging enclosure, said second packaging enclosure being capable of being sealed and maintaining an internal vacuum for a length of time sufficient to complete the process steps, set forth below, requiring an internal vacuum in the second packaging enclosure;

(c) placing the second packaging enclosure within the first packaging enclosure;

(d) placing the article to be packaged within the second packaging enclosure;

(e) filling the second packaging enclosure with an amount of resilient loose fill dunnage material, the amount of resilient loose fill dunnage material having an original volume greater than the internal volume of the first packaging enclosure;

(f) sealing the second packaging enclosure;

(g) creating an internal vacuum within the second packaging enclosure, said internal vacuum being sufficient to cause the original volume of the resilient loose fill dunnage material to decrease below the internal volume of the first packaging enclosure;

(h) sealing the first packaging enclosure; and

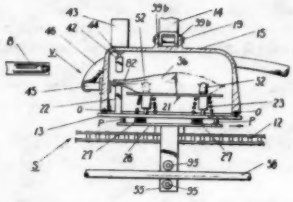
(i) releasing the vacuum within the second packaging enclosure thus allowing the resilient loose fill dunnage material to increase in volume until being substantially equal to the volume of the first packaging enclosure.

4,640,081

AUTOMATIC PACKAGING APPARATUS

Masashi Kawaguchi, Yokohama, and Masaru Yasumune, Mihara, both of Japan, assignors to Kabushiki Kaisha Furukawa Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 378,656, May 17, 1982, abandoned. This application May 24, 1985, Ser. No. 738,098
Claims priority, application Japan, May 23, 1981, 56-78351
Int. Cl.[4] B65B 31/02
U.S. Cl. 53—510 13 Claims



9. An automatic packing apparatus comprising;

a bag forming device for automatically forming bags each containing at least one article; and

a vacuum sealing device for sealing open ends of the bags in a vacuum;

said bag forming device further comprising:

a tubular film forming device in the shape of a tube for continuously forming an elongated sheet of film into a tube of the film and wrapping the articles fed into the tubular film forming device in a line;

a film sealing and cutting device for cutting the tube of film at preset space intervals to form each of the bags, one end of which is completely sealed and the other end of which is partly sealed; and

a feeding device for feeding the bags formed by the film sealing and cutting device to the vacuum sealing device at a faster speed than that of the travel of the tube;

said vacuum sealing device further comprising:

at least one bag supporting device, revolving synchronously with the feeding device so that each bag supporting device can receive a respective one bag fed by the feeding device along a traveling path, the bag supporting device having a base plate which is provided on travel means for transferring the bag supporting devide, a pillow head fixed to the base plate on one side thereof for resting thereon the open end of the bag and a plate-like supporting member supported by at least one elastic member over the base plate, the upper surface of the pillow head and the plate-like supporting member being normally positioned in the same horizontal plane;

at least one vacuum cover, cooperating with each bag supporting device to form a vacuum box in which the open end of the each bag is sealed under a vacuum and revolving synchronously with said bag supporting device while moving vertically to open and close said vacuum cover

having a heating member for sealing the open end of each bag and a plurality of pushing members formed on the inner surface thereof, which abut against the plate-like supporting member to lower the supporting member under the weight of the vacuum cover when the vacuum cover is placed on the bag supporting device; and

a device for evacuating the inner space of the vacuum box.

4,640,082

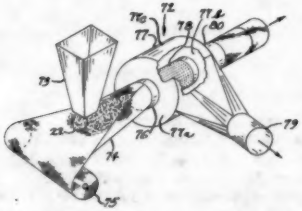
APPARATUS FOR PACKAGING LOOSE FIBROUS MATERIAL

Gurdev S. Gill, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 4, 1985, Ser. No. 707,623

Int. Cl.[4] B65B *1/20*

U.S. Cl. 53—523 **2 Claims**



1. Apparatus for vacuum-compacting and packaging loose fibrous material within a web of porous material comprising a suction housing having a pair of opposite end walls and an enclosing sidewall, said end walls having a pair of aligned openings respectively therein, a perforated duct extending through the suction housing in spaced relationship to the enclosing sidewall, having inlet and outlet openings aligned respectively with the openings in said end walls, and being formed of material having perforations therein, the perforations being of a size normally preventing passage of fibrous material while allowing passage of air therethrough, means for passing a web of porous material through the perforated duct and existing from said outlet opening, supply means for supplying loose fibrous material onto said web of porous material upstream of said inlet opening and accommodating the passage of air to the inlet opening of said perforated duct, an air exhaust duct communicating with said housing, and means for forming said web of porous material into a sleeve around said fibrous material upstream of said outlet opening so that as said filled sleeve passes through said housing it is evacuated and collects said fibrous material.

4,640,083

APPARATUS FOR PRODUCING BAGS AND PACKING ARTICLES THEREIN

Shizuo Takahashi, Abiko, and Kiyoshi Yamashita, Toride, both of Japan, assignors to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan

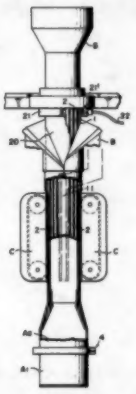
Filed May 31, 1984, Ser. No. 615,724

Claims priority, application Japan, May 31, 1983, 58-82144[U]; May 31, 1983, 58-82145[U]

Int. Cl.[4] B65B *9/06*

U.S. Cl. 53—551 **1 Claim**

1. In an apparatus for forming and filling a series of bags, said apparatus including a vertical bag-making cylinder around which a film can be wrapped to form a tube as the film passes along the length of said bag-making cylinder from its upper end to its lower end and through the interior of which the articles intended to be contained in each bag can flow, a sealing means sealingly located adjacent the lower end of said bag-making cylinder for closing the open top of a downstream bag and closing the bottom of an adjacent upstream bag, and air removal means for removing air from within a bag which contains articles prior to the closing of its open top, the improvement wherein said air removal means comprises a plurality of parallel grooves in the outer periphery of said bag-making cylinder which extend in parallel with a central axis thereof from its lower end toward its upper end; a plurality of upwardly inclined holes in said bag-making cylinder which extend from its interior to each of said plurality of parallel grooves; an annular element surrounding said bag-making cylinder near its upper end, said annular element including an



annular groove therein which communicates with said plurality of parallel grooves in the outer periphery of said bag-making cylinder; and a suction pipe connected to said annular element and in communication with said annular groove; said suction pipe enabling air to be sucked out of each bag into the interior of said bag-making cylinder, then through said holes into said plurality of parallel grooves in the outer periphery of said bag-making cylinder, along said parallel grooves and into said annular groove in said annular element, and then into said suction pipe.

4,640,084

MOWING APPARATUS

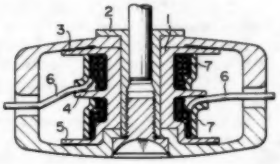
Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,538

Claims priority, application Japan, Feb. 7, 1984, 59-15886[U]

Int. Cl.[4] A01D *34/67;* A01G *3/06*

U.S. Cl. 56—12.7 **2 Claims**



1. A mowing apparatus comprising:

a casing containing a cord having a free end serving as a cutter;

a spool defined by a cylindrical portion and a pair of circular side flanges, said spool having at least one coil of the cord wound thereon; wherein the improvement comprises:

holding means comprising an elastic band enclosing an outer periphery of the coil of the cord wound on the spool, said elastic band having in its free unstretched state a larger

width and a smaller outer diameter than the coil, said free end of said cord extending from said coil between one of said pair of circular side flanges and an edge of said elastic band.

4,640,085

HARVESTER THRESHER

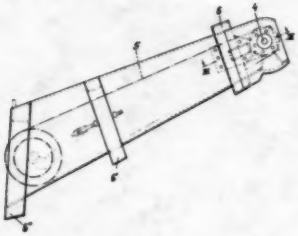
Karl Rupprecht, Hilter, Fed. Rep. of Germany, assignor to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,646

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406696

Int. Cl.[4] A01D *57/00, 47/00, 45/00*

U.S. Cl. 56—14.6 2 Claims



1. In a self-propelling harvester thresher comprising a machine frame and a drawing channel pivotally connected to the machine frame at a pivot axis, said drawing channel carrying at a free end thereof a cutting mechanism or a corn picker, the improvement comprising said drawing channel having an elongated hollow body carrying a plurality of reinforcing frames surrounding said body and spaced from each other along the length of said body, said body having side walls which are provided in the region of said pivot axis with additional reinforcing walls so that said side walls are in said region double-walled, whereby torsional strength of the pivotable drawing channel is substantially increased, said channel also including spacing rings each positioned in a hollow space between a respective side wall and a respective additional reinforcing wall in the region of said pivot axis and rigidly connected to said side walls and said additional reinforcing walls, said channel also including reinforcing ribs extending in a ray-like manner from said spacing rings and connecting to each other said spacing rings, said side walls, said additional reinforcing walls and an adjacent one of said reinforcing frames.

4,640,086

ELECTRICAL INSULATION TAPING MACHINE WITH UNIFORM TAPE TENSIONING

Andre J. Levino, Sewickley Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1985, Ser. No. 793,053

Int. Cl.[4] D07B *7/14;* B65H *81/08*

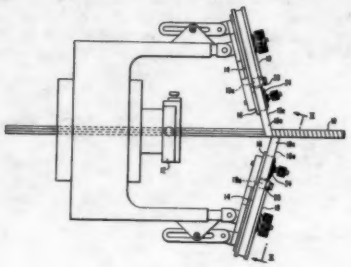
U.S. Cl. 57—3 5 Claims

1. An electrical insulation taping machine comprising:

a head mounted for rotation about an axis on which one or more electrical conductors to be taped are located;

a cylindrical tape roll mounted on said head, said tape roll having a core affixed to said head and a quantity of electrical insulation tape wound on said core with a layer of said tape fed through a tape path to said axis for taping said conductors, said tape being unwound from said core, traversing said tape path, and wound on said conductors as said head rotates about said axis;

a tape tensioning device mounted on said head clear of said tape roll, said tape tensioning device comprising a cylindrical tensioning wheel over which said tape path passes and means for adjustably spring loading said wheel against said head to tension said tape substantially uniformly between said tensioning device and said conductors being



taped independent of what quantity of said tape is on said core.

4,640,087

ROPE-MAKING MACHINE

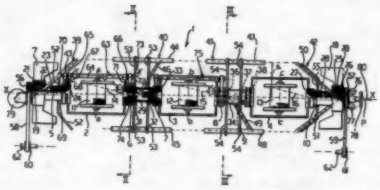
Giorgio Targa, Via S. Giovanni Battista alla Creta, 2, and Vitaliano Russo, Via P. Litta, 2, both of Milan, Italy

Filed Jul. 24, 1984, Ser. No. 634,032

Claims priority, application Italy, Jul. 26, 1983, 22234 A/83; Feb. 21, 1984, 19722 A/84

Int. Cl.[4] D07B *3/04*

U.S. Cl. 57—58.36 6 Claims



1. A rope-making machine comprising a plurality of reel-carrying cradles aligned along an axis (X—X) and oscillating about said axis, and a plurality of first strand guide structures supported rotatably about said axis, wherein said machine further includes respective couplings which are rotatable about said axis and fix said cradles together in pairs coaxially, whereby said cradles define a rigid beam with said couplings, and a fixed stand at each end of said beam which supports a respective end of said beam free of intermediate supports, said first strand guide structures being supported by said couplings, and second strand guide structures of tubular form spaced from and parallel to said axis, said second strand guide structures supported from respective ones of said couplings.

4,640,088

AUTOMAT LOCATION SYSTEM

André Lattion, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 612,068

Claims priority, application United Kingdom, May 24, 1983, 8314305

Int. Cl.[4] D01H *15/02;* B65H *67/04, 54/26*

U.S. Cl. 57—263 4 Claims

1. In combination,

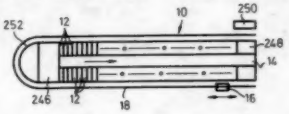
a plurality of aligned spinning stations, each said station having a friction roll, a cradle being movable from a first position enabling contact of an empty tube in said cradle

with said friction roll to an uppermost position to space a package thereon from said friction roll and a calling station having a first signal directing means for emitting a call signal, a second signal directing means to indicate a cradle in said uppermost position and a third signal directing means to indicate the presence of a full package in said cradle;

a service tender movable relative to said spinning stations and being selectively operable to perform a package doffing operation or a piecing operation;

a detector on said tender responsive to a call signal from a respective spinning station to align said tender with said respective spinning station;

a first unit on said tender responsive to said second signal



directing means to emit a first signal in response to the presence of said cradle in said uppermost position; and

a second unit on said tender responsive to said third signal directing means to emit a second signal in response to a tube or package on said cradle in said uppermost position;

said tender being responsive to a predetermined combination of said signals from a respective calling station and said units to perform a predetermined operation in a respective spinning station whereby said service tender is adapted to stop in alignment with a station issuing a call signal only if predetermined combinations of said signals are detected and is conditionable to perform a package doffing operation or a piecing operation in response to detection of respective combinations of said predetermined combinations of said signals.

4,640,089

METHOD AND DEVICE FOR SPINNING A YARN IN ACCORDANCE WITH THE OPEN END-FRICTION SPINNING PRINCIPLE

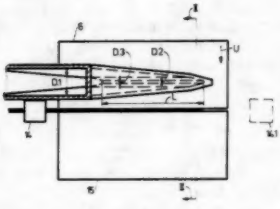
Herbert Stalder, Kollbrunn; Josef Baumgartner, Sirnach, and Arthur Würmli, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Winterthur, Switzerland

Filed Jul. 8, 1986, Ser. No. 883,373

Claims priority, application Switzerland, Jul. 12, 1985, 21/85

Int. Cl.⁴ D01H *7/898, 7/892*

U.S. Cl. 57—401 **31 Claims**



1. A method for spinning a yarn or the like in accordance with the open end friction spinning principle, comprising the steps of:

separating fibers from a body of fibers;

transporting said fibers in a freely floating state by means of a pneumatic fiber transporting airstream guided in a fiber transport passage in a direction of movement inclined at a predetermined acute angle to an exit opening of said fiber transport passage;

accelerating said pneumatic fiber transporting airstream in a predetermined region which terminates at the exit opening of the fiber transport passage and which predetermined region has a predetermined height;

subsequently transferring said fibers to a moving perforated surface of a friction spinning means which is subjected to underpressure;

intercepting said pneumatic fiber transporting airstream by means of said friction spinning means;

passing said pneumatic fiber transporting airstream through said moving perforated surface;

employing said friction spinning means for forming said fibers into a yarn at a yarn formation position of the friction spinning means; and

withdrawing said formed yarn in a predetermined yarn withdrawal direction.

4,640,090

FIBER CONDUCTING CHANNEL OF AN OE FRICTION SPINNING DEVICE

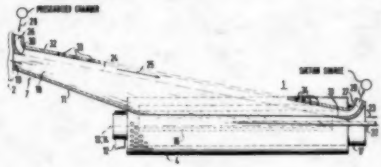
Theo Lembeck, Moenchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Jan. 17, 1986, Ser. No. 820,402

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502427

Int. Cl.⁴ D01H *7/898*

U.S. Cl. 57—401 **12 Claims**



1. In an OE friction spinning spinning device having a fiber loosening device and means for forming a spinning wedge, the improvement comprising a fiber conducting channel having a wall, means for generating a transporting air current in said fiber conducting channel for carrying fibers from the fiber loosening device to the spinning wedge, said wall having at least two openings formed therein being spaced from each other along said transporting air current for the passage of guiding air forming at least one guiding air stream parallel to said transporting air current in said fiber conducting channel.

4,640,091

APPARATUS FOR IMPROVING ACCELERATION IN A MULTI-SHAFT GAS TURBINE ENGINE

Cyril A. M. Blizzard, Greenfield Park, Canada, assignor to Pratt & Whitney Canada Inc., Longueuil, Canada

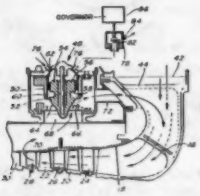
Division of Ser. No. 574,387, Jan. 27, 1984, Pat. No. 4,590,759. This application Jan. 8, 1986, Ser. No. 817,056

Int. Cl.⁴ F02C *9/16*

U.S. Cl. 60—39.29 **5 Claims**

1. A free turbine gas turbine engine comprising at least a compressor shaft mounting a plurality of blade stages, an output shaft mounting at least a turbine blade stage, means for bleeding air from the compressor, bleed valve means including a cylinder and piston means within the cylinder, the piston having first and second faces, the first face of the piston defining with the cylinder a first valve chamber and the second face defining with the cylinder a second chamber, said means for bleeding the compressor air communicating with an inlet in said first valve chamber, hollow pre-swirl members provided upstream of said compressor, said pre-swirl members each provided with means for forming a jet flap, an outlet provided in said first valve chamber, means communicating said outlet

from said first valve chamber to said hollow pre-swirl members, means communicating a high pressure air source downstream of the compressor to an inlet in said second valve chamber, an outlet in said second valve chamber, a control valve, governor means operatively connected to said control valve, conduit means communicating said outlet in said second valve chamber to said control valve, load sensing means connected to the governor whereby, under minimum power requirements, said governor will maintain said control valve open thereby maintaining a low pressure in the second valve chamber thus maintaining said bleed valve open to provide a jet flap and thus a pre-swirl to the compressor, and when a load is being sensed, the governor will progressively close said control valve thus increasing said pressure in the second valve chamber, thereby closing the bleed valve and eliminating the pre-swirl to enable the compressor to provide a greater gas horsepower.



4,640,092

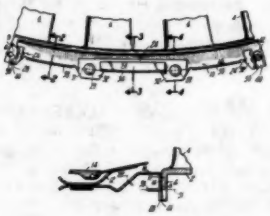
COMBUSTION CHAMBER REAR OUTER SEAL

Robert E. Coburn, Mansfield Center, and John A. Matthews, Melrose, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 3, 1986, Ser. No. 835,136

Int. Cl.[4] F02C *3/06, 7/20, 1/00*

U.S. Cl. 60—39.36 **9 Claims**



1. A sealing device for sealing between the downstream end of a combustion chamber outer wall and a forwardly facing surface formed by tabs on the turbine inlet vanes, the device including:

a sealing element having a flat rearwardly facing radial portion for contact with said forwardly facing surface formed by the tabs,

a row of bolts securing the elements to said tabs,

reinforcing plates extending between adjacent bolts in the row and secured by said bolts to the forward side of said portion, and

flanges on the outer edge of said portion of the element in the spaces not covered by the plates.

4,640,093

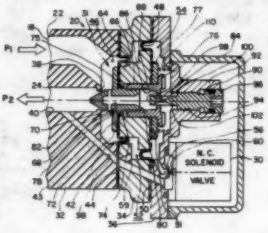
FUEL METERING SYSTEM

James M. Eastman, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 3, 1985, Ser. No. 771,756

Int. Cl.[4] F02C *9/26*

U.S. Cl. 60—39.281 **9 Claims**



1. A metering valve for supplying fuel to a turbine engine in response to an operational signal, said metering valve comprising:

a housing having a cavity therein with an inlet port, a control port, and an outlet port, said inlet port being separated from said outlet port by a first annular seat, said first annular seat being connected to said outlet port by an outlet conduit, said control port being connected to said outlet conduit by a by pass conduit;

wall means for separating said cavity into first, second and third chambers, said first chamber being connected to said inlet port for receiving fuel having a fluid pressure P_1, said second chamber being connected to said outlet conduit, said third chamber being connected to said first chamber and said control port;

a plunger connected to said wall means having a face therein that moves with respect to said first annular seat to regulate the flow of fuel from said first chamber into said outlet conduit, said fuel in said outlet conduit having a fluid pressure P_2;

feedback valve means connected to said wall means for controlling the fuel flow from said first chamber to said third chamber; and

electrohydraulic means responsive to said operational signal for rapidly pulsing fuel flow from said third chamber to said by pass conduit to develop a fluid pressure P_x in said third chamber, said fluid pressure P_1 in said first chamber and fluid pressure P_2 in said second chamber and fluid pressure P_x is said third chamber positioning said wall means such that substantially a steady flow of fuel is metered from said first chamber through said first seat into said outlet conduit, said pulsing fuel flow from said third chamber being parallel with and substantially smaller than said steady flow from said first chamber.

4,640,094

FLOW AMPLIFYING STEERING SYSTEM

Richard A. Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 4, 1986, Ser. No. 825,848

Int. Cl.[4] B62D *5/06*

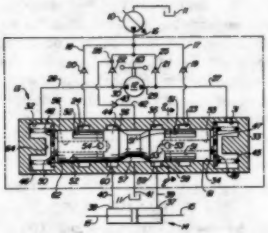
U.S. Cl. 60—385 **21 Claims**

1. A power steering system for a vehicle including a source of pressurized fluid, a fluid reservoir, a bidirectional hydraulic steering motor, a bidirectional hand pump having first and second work ports, and a control valve providing flow amplification of the output from said bidirectional pump, said control valve comprising:

a valve housing having a central bore, means for defining first and second chambers along said bore, said chambers having fluid communication with said first and second

work ports respectively, first and second supply inlets along said bore in fluid communication with said source, first and second service outlets along said bore, each outlet in fluid communication with an opposing fluid inlet of said motor, first and second hand pump inlets along said bore in fluid communication with said first and second work ports respectively and a reservoir outlet in fluid communication with said reservoir;

a valve member movably located within said bore having first and and second extended recesses in fluid communication with said first and second supply inlets respectively, first and second proportioning recesses in fluid communication with said first and second hand pump inlets respectively, a reservoir channel, first and second lands for blocking fluid flow to or from said first and second service outlets respectively, a third land for blocking fluid communication between said first hand pump



inlet and said first supply inlet, and a fourth land for blocking fluid communication between said second hand pump inlet and said second supply inlet;

means for communicating fluid pressure in said first and second proportioning recesses to said first and second chambers respectively;

means for maintaining said valve member in a neutral position in the absence of fluid flow from said bidirectional hand pump wherein said first and second lands block fluid flow to or from said service outlets; and

means for moving said valve member to an operative position in proportional response to a difference in pressure between said chambers where in said operating position one of said service outlets is in fluid communication with its corresponding proportioning and extended recesses and the other of said service outlets is in fluid communication with said reservoir outlet across said reservoir channel.

4,640,095

DIGITAL ELECTRO-HYDRAULIC VALVE ARRANGEMENT

William K. Engel, Peoria, Ill., and Stephen R. Bogert, Kennewick, Wash., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jan. 28, 1985, Ser. No. 695,512
Int. Cl.[4] F16D *33/02*
U.S. Cl. 60—443 **7 Claims**

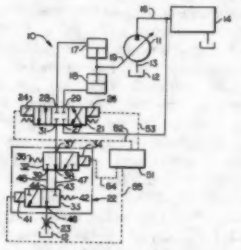
1. A digital electro-hydraulic control system for controlling the displacement of a variable displacement machine having a displacement control member and a pair of actuators operatively connected to the displacement control member comprising:

a source of pressurized fluid;

a tank;

a solenoid actuated directional control valve having an inlet port, a pair of motor ports and a discharge port, said inlet port being connected to said source of pressurized fluid and the motor ports being connected to the actuators of the variable displacement machine, said directional control valve being movable between a neutral position and an operative position at which the inlet port is in fluid communication with one of the motor ports and the other motor port is in communication with the discharge port;

a digital electro-hydraulic valve arrangement positioned between the discharge port of the directional control valve and the tank, said valve arrangement including first and second solenoid actuated valves each having an inlet port and an outlet port and being movable between a first position at which the inlet port is in communication with the outlet port and a second position at which the inlet port is blocked from the outlet port, one of said first and second valves including means for biasing said one valve to the first position and having a predetermined response



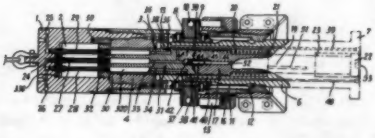
time for moving from the first position to the second position, the other of said first and second valves including means for biasing said other valve to the second position and having a response time for moving from the second position to the first position substantially equal to the predetermined response time of the one valve, said outlet port of said first valve being connected to the inlet port of the second valve to establish a flow path between the inlet port of the first valve and the outlet port of the second valve in response to said other valve being moved from the second position to the first position, said flow path being disrupted when the one valve is moved from the first position to the second position.

4,640,096

LOAD CARRYING CONNECTION AND HYDRAULIC FLUID TRANSMISSION DEVICE

Alain Lechon, Pau, and Alain Viard, Muret, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Nov. 19, 1984, Ser. No. 673,047
Claims priority, application France, Nov. 21, 1983, 83 18459
Int. Cl.[4] B60T *13/00*; E03B *37/00*
U.S. Cl. 60—547.1 **12 Claims**



1. A load carrying connection device comprising a selflocking connector and a mandril firmly secured to loads to be carried and adapted to transmit hydraulic pressures and flows through the mandril, comprising in combination:

a connector head (1) including a hollow connector body (3) and an internal sleeve (4) providing an elongated chamber (2);

a hollow mandril extending into said connector body (3) and adapted to be locked to said connector head (1);

a valving piston (17) having a front face carried within said

mandril (6) and provided with a plurality of annular axially spaced seals (44, 45, 46) at its periphery,

a return spring (20) in said mandril for biasing said valving piston toward said connector head (1);

a mobile piston (31) slidable with said chamber (2) and having a piston head (32) movable in said chamber (2) and limited in a bottom position by said internal sleeve (4),

said mobile piston (31) having a lower portion within connector body (3) and having an end face adapted to bear on said front face of said valving piston (17) within said mandril (6);

duct means for flow of hydraulic fluid between said connector head (1) and said mandril (6) including

ducts (27, 28 and 29) is said chamber (2), and passing through said head (32),

corresponding housings (320) in said mobile piston (31) for receiving said ducts (27, 28) and (29) when said mobile piston is in top position;

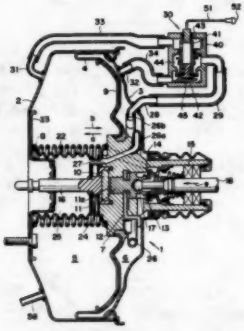
said mobile piston (31) having corresponding ducts (34, 35) provided wih orifices (36, 37) at its lateral periphery for communication with longitudinal ducts (39, 40) in the mandril (6) for transmission of pressure fluid to the loads carried by the mandril, whereby when said mobile piston (31) is in said bottom position, said orifices (36, 37) communicate mutually together and when the mobile piston (31) is followed by said valving piston (17) in top position of said mobile piston (31), the annular zones of said orifices (36, 37) of ducts (39, 40) of the mandril are closed by said annular seals (44, 45, 46) spaced apart along the lateral face of the valve piston (17) on each side of said annular zones of said duct orifices.

4,640,097

BRAKE BOOSTER

Michio Kobayashi, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co. Ltd., Japan

Filed May 30, 1984, Ser. No. 615,455
Claims priority, application Japan, Jun. 2, 1983, 58-98571
Int. Cl.[4] B60T *13/20*
U.S. Cl. 60—554 **8 Claims**



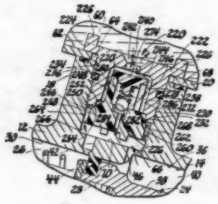
1. A brake booster comprising a housing (2,3) defining an interior space, diaphragm means (4) connected to said housing in said interior space and dividing said interior space into a constant pressure chamber (5) and a variable pressure chamber (6), a power piston (7) movable in said housing and connected to said diaphragm means for moving said diaphragm means in said space, a push rod (16) for pressing a master cylinder of a brake, reaction means (10) operatively engaged between said power piston and said push rod for transmitting pushing forces from said power piston to said push rod, a vacuum valve (13) in said power piston for opening and closing communication between said constant pressure chamber and said variable pressure chamber, an open air valve (14) in said power piston for opening and closing communication between said variable pressure chamber and the ambient atmosphere, a relay rod (11) movably mounted in said housing and operatively connected to said vacuum valve and said open air valve for opening and closing said vacuum and open air valves with movement of said relay rod, said relay rod having one end which is engageable against said push rod through said reaction means, an operating rod (18) adapted to be pushed by movement of a brake pedal of a brake, said operating rod being engaged with said relay rod for moving said relay rod, a hollow expansion body (22) disposed in said constant pressure chamber and connected between said housing and said push rod, said expansion body defining an expansion chamber (25) and being expandable and contractable in an axial direction of movement of said push rod in said housing, and pressure valving means connected to said housing and between said expansion chamber, said constant pressure chamber and said variable pressure chamber, said pressure valving means having a plurality of positions for establishing varied communication between said expansion chamber and at least one of said constant pressure chamber and said variable pressure chamber so that an inner pressure of said expansion chamber can be changed dependent on a pressure in one of said constant pressure chamber and said variable pressure pressure chamber to change a boosting ratio of said brake booster, said valving means positioned externally of said housing space.

4,640,098

QUICK TAKE-UP MASTER CYLINDER VALVE ARRANGEMENT

David L. Brademeyer, Centerville, and Timothy M. Welch, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 591,179, Mar. 19, 1984, abandoned. This application Oct. 17, 1985, Ser. No. 788,732
Int. Cl.[4] B60T *11/08*
U.S. Cl. 60—578 **2 Claims**



1. In a quick take-up master cylinder having a boss with a vertically oriented valve-controlled first passage, compensation ports at the bottom of said first passage connecting with the master cylinder bore, and a hydraulic fluid reservoir mounted on the upper end of said boss and maintaining a supply of hydraulic fluid in said first passage and the master cylinder bore, a compensation port control valve assembly comprising:

a housing having its lower end sealingly secured in said vertically oriented valve-controlled passage and having a vertically extending stepped bore having a shoulder and providing a valve chamber open to the compensation ports and an upper passage section open to said hydraulic fluid reservoir;

valve means in said valve chamber having a specific gravity less than the specific gravity of the hydraulic fluid in said first passage so as to normally buoyantly rest against said shoulder and prevent any substantial flow of hydraulic fluid between said master cylinder bore and said reservoir through the compensation ports in one valve means condition of operation, said valve means being sensitive to a pressure differential at said shoulder biased toward the

master cylinder bore to move downwardly away from said first shoulder and permit fluid flow through said valve housing bore from said reservoir to said master cylinder;

said valve means including

a valve body having a base section provided with fluted guides circumferentially spaced thereon for guiding said body in vertical movements in said valve chamber, an axially extending second passage through said base section, a check valve caging section above said base section having an annular valve seat therein with said second passage opening below and to said annular valve seat, a check valve retained in said caging section above said annular valve seat and having means resiliently biasing said check valve toward said annular valve seat to normally close said second passage, and a valve cap on said caging section, said valve cap and said caging section permitting hydraulic fluid flow therepast;

said resiliently biased check valve controlling said second passage to normally prevent fluid flow through said second passage between said master cylinder bore and said reservoir and operable to open at a predetermined master cylinder quick take-up pressure to permit fluid flow from said master cylinder bore to said reservoir through said second passage and past said caging section and said valve cap to relieve any excess quick take-up pressure that may be generated in said master cylinder bore during master cylinder actuation.

4,640,099

PROCESS AND INSTALLATION FOR COOLING A VISCOUS AND IN PARTICULAR FOOD PRODUCT

Claude Gibot, Malakoff, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

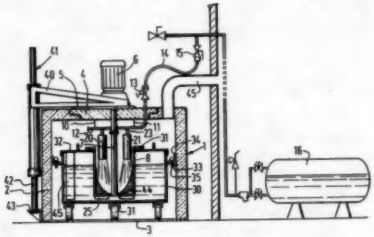
PCT No. PCT/FR85/00040, § 371 Date Oct. 29, 1985, § 102(e) Date Oct. 29, 1985, PCT Pub. No. WO85/03999, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 5, 1985, Ser. No. 800,637

Claims priority, application France, Mar. 5, 1984, 84 03375

Int. Cl.⁴ F25D *25/00*

U.S. Cl. 62—62 **16 Claims**



1. A process for cooling a viscous product, and in particular a food product to a temperature above 0° C., said process comprising effecting a thermal exchange between a cryogenic medium and a mass of said product through a metal wall of a pot immersed in the mass of product, by generating carbonic acid snow constituting said cryogenic medium in said pot while continuously maintaining the mass of product in a stirred state, and regulating said snow generation so as continuously to maintain in a viscous state the product which is in contact with said pot.

4,640,100

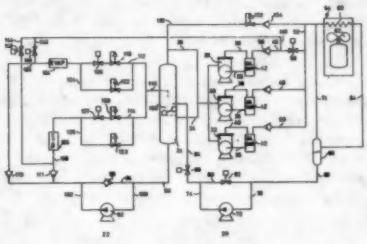
REFRIGERATION SYSTEM

Vladimir Goldstein, Concord, Canada, assignor to Sunwell Engineering Company Limited, Woodbridge, Canada

Filed Jan. 15, 1985, Ser. No. 691,631

Int. Cl.⁴ F25B *43/00*

U.S. Cl. 62—197 **18 Claims**



1. A refrigeration system comprising a first phase separation device containing a supply of refrigerant in liquid and vapour phases, a compressor to withdraw refrigerant in the vapour phase from said supply and compress it, condenser means to condense the refrigerant supplied by said compressor, second phase separation means to segregate liquid and vapour phases of said refrigerant delivered from said condenser, liquid pump means to transfer liquid refrigerant from said phase separation means through expansion means to said first phase separation means, evaporator means to receive liquid refrigerant from said second phase separation means and pump means to circulate refrigerant through said evaporator and return it to said first phase separation device.

4,640,101

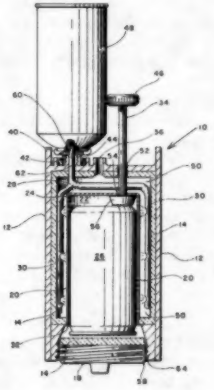
PORTABLE BEVERAGE CHILLER

Ken A. Johnson, 6574 NW. Third St., Margate, Fla. 33063

Filed Dec. 18, 1985, Ser. No. 810,279

Int. Cl.⁴ F25D *3/10*

U.S. Cl. 62—294 **11 Claims**



1. A portable beverage chiller for cooling a removable beverage container placed therein comprising:

an outer shell;

an inner shell concentrically disposed within the outer shell and being of a thermoconductive material, said inner shell having interior dimensions for a close fitting relationship

with the beverage container for efficient conductive heat transfer therewith, and with a first end of the inner shell defining an opening for receiving and removing the beverage container;

an annular gas expansion chamber disposed between the inner shell and outer shell;

an evaporator tube mounted within the gas expansion chamber and having at least one discharge orifice therein, said discharge orifice being disposed to discharge expanding refrigerant gas therefrom to impinge directly upon the inner shell;

an evaporator tube extension in fluid communication with the evaporator tube, said extension penetrating the outer shell and terminating in a connector for removable attachment to a source of compressed refrigerant gas;

an exhaust port through the outer shell for escape of expanded refrigerant gas from the expansion chamber; and

an ejector penetrating the inner shell and outer shell for removal of the beverage container.

4,640,102

SELF-COOLING CONTAINER FOR BEVERAGES

Marcos Tenenbaum; Luis De Guzman, and Daniel M. Tenenbaum, all of 3559 Paraguay Street, 6th Floor - A, Buenos Aires 1425, Argentina

Filed Mar. 3, 1986, Ser. No. 835,622

Int. Cl.[4] F25D *3/10*

U.S. Cl. 62—294 **5 Claims**

1. A self-cooling container for a beverage which comprises:

(a) a housing for holding said beverage therein;

(b) a top end having an opening tab for removing the beverage from said housing, said top end secured to said housing;

(c) a capsule having pressurized coolant therein, said capsule being immersed in said beverage and means for affixing said capsule to a bottom of said housing; and

(d) a conduit extending from said capsule through said top end, said conduit having a bent obstructed distal end and means for removing said bent obstructed distal end, where by when said bent obstructed distal end is removed at said semi-cut portion, said coolant will escape through said conduit into ambient air causing said beverage to be cooled within said housing.

4,640,103

DOUBLE HEAD FLAT KNITTING MACHINE

Hans Schieber, Bopfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,627

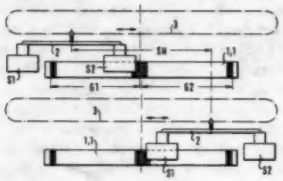
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1984, 3429913

Int. Cl.[4] D04B *7/04*

U.S. Cl. 66—64 **6 Claims**

1. Double head flat knitting machine with at least one front and one rear needle bed and two carriages reciprocably movable over the needle beds by means of a reversing drive with a selectively-adjustable carriage stroke wherein each of said front and rear needle beds is comprised of:

(a) two contiguous needle beds disposed end to end to provide an approximately double operative width needle bed



provided with a continuous needle space and with needles lowered into the needle beds, and

(b) at least one complete carriage detachably connected with the reversing drive at one of two positions.

4,640,104

NEEDLE SELECTION ARRANGEMENT FOR A CIRCULAR KNITTING MACHINE

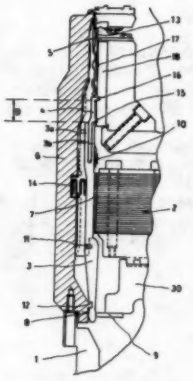
José M. Dalmau Güell, Barcelona, Spain, assignor to Jumberca, S.A., Badalona, Spain

Continuation of Ser. No. 657,967, Oct. 5, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 825,672

Claims priority, application Spain, Oct. 10, 1983, 526.696

Int. Cl.[4] D04B *15/68, 15/82*

U.S. Cl. 66—222 **5 Claims**



1. A needle selection apparatus for a circular knitting machine, comprising:

a selector box including selector cams; selector jacks, each selector jack having two upper extensions; intermediate jacks corresponding to respective ones of the selector jacks and positioned between the upper extensions of the corresponding selector jack; needles each having a butt; and cam sets for the intermediate jacks and the needles, wherein the intermediate jacks are provided with a long upper butt for tucking and a short lower butt for jersey knitting, said intermediate jacks being in engagement with respective ones of the selector jacks which selectively adopt three different angles of tilt, so that said intermediate jacks correspondingly adopt three angles of tilt, thereby determining three positions of the upper and lower butts so that the upper and lower butts are emergent corresponding to the knit position, so that part of the upper butt is emergent corresponding to the tuck position, and so that there is no emergent butt corresponding to the

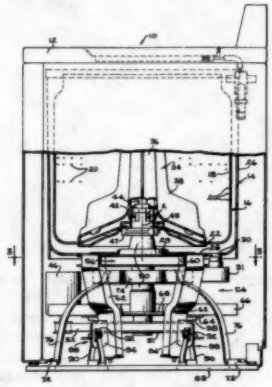
welting position, each set of cams having an upper channel for engaging the butt of the needle, an intermediate channel for engaging the upper butt, and a lower channel for engaging the short butt of the intermediate jack, the intermediate channel being spaced from the lower channel by a distance (d) smaller than a distance (D) between lower edges of the upper and lower butts.

4,640,105

AUTOMATIC WASHER SUSPENSION SYSTEM

Gerald J. Kushner, Louisville, Ky., and Daniel N. Toma, Georgetown, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 29, 1985, Ser. No. 760,350
Int. Cl.[4] D06F *37/24*
U.S. Cl. 68—23.3 **14 Claims**



1. In a vertical axis washing machine having a base and further having a movable mass including a rotatable basket and an agitator arranged in said basket, and means for imparting oscillation motion to said agitator and rotational movement to said basket which generates both vertical and horizontal vibration to said movable mass a suspension system for supporting said movable mass above said base, comprising:

a support member; a plurality of circumferentially spaced spring members connected at their lower end to said base and converging therefrom upwardly and radially inwardly with their upper ends connected to said support member;

a frame structure connected to said movable mass including an upper frame portion, and a lower frame portion interconnected by leg members extending between said upper and lower frame portions;

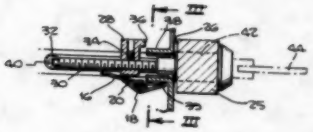
a plurality of circumferentially spaced links extending in the general direction of the vertical axis, each of said links having its upper end connected to said support member and their lower end connected to said lower end of said leg member of said frame structure below said support member to thereby support said movable mass above said base in a manner which absorbs both the vertical and horizontal vibrations of said movable mass.

4,640,106

DEVICE FOR PREVENTING UNAUTHORIZED USE OF A CASSETTE TAPE DECK

Jay S. Derman, Redondo Beach, Calif., assignor to Z-Lock Company, Inc., Redondo Beach, Calif.

Filed Feb. 5, 1985, Ser. No. 698,313
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **7 Claims**



1. In a device for inhibiting use of a cassette tape deck having a cassette tape chamber accessible through a chamber opening, the combination of:

a U-shaped member having a length, width and thickness adapted to be received within said chamber through said opening;

a transverse member connecting ends of said U-member and having at least one dimension greater than the corresponding dimension of said chamber opening to limit movement of the U-shaped member into the chamber;

a lock element connected with said U-shaped member;

means for adjusting the position of the lock element within the chamber for restricting outward movement of the device and adapted to engage tape deck means within said chamber;

and lock means for changing the position of the lock element to release the U-shaped member for withdrawal thereof from said chamber;

said lock means being carried on the transverse member;

said adjustable means includes a threaded member extending in an in and out direction with respect to said chamber, said threaded member connecting said transverse member and said U-shaped member;

said lock element having threaded connection with said threaded member for adjusting said lock element to a selected position along said threaded member.

4,640,107

SAFETY LOCK APPARATUS FOR AN ELECTRICAL PLUG

Luman C. Slade, 7717 Westwind La., Cincinnati, Ohio 45242

Filed Dec. 12, 1985, Ser. No. 807,967
Int. Cl.[4] E05B *65/00*
U.S. Cl. 70—57 **17 Claims**

1. A safety lock apparatus for an electrical plug having a plug body from which extends a plurality of prongs adapted to be inserted into an electrical outlet, the safety lock apparatus comprising:

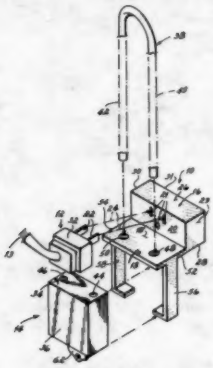
receiver means for receiving therethrough, in a first direction, prongs of a plug;

spacer means extending generally in said first direction from said receiver means for spacing said receiver means from an electrical outlet so that prongs received through said receiver means are prevented from being inserted into the electrical outlet;

shelf means extending from said receiver means in a second direction generally opposite said first direction and cooperable with a padlock for securing a plug body of a plug to said receiver means when its prongs are received through said receiver means, a portion of said shelf means adapted to be placed between a padlock body of the padlock and a U-shaped shackle of the padlock so that (i) the shackle is lockably receivable in the padlock body and (ii) the plug body is secured to said receiver means, whereby to pre-

vent removal from said receiver means prongs extending from a plug body so secured; and

securement means operably associated with said shelf means for securing a portion of the padlock to said shelf means,



said securement means comprising a pair of spaced apart resilient gripper arms depending from said seat means in a direction generally perpendicular said second direction and between which a padlock is removably grippable.

4,640,108

DOOR LOCKING SYSTEM

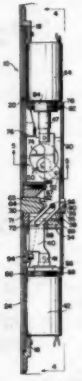
Quentin H. Young, San Antonio, Tex., assignor to Southern Steel Company, San Antonio, Tex.

Continuation of Ser. No. 393,701, Jun. 30, 1982, Pat. No. 4,509,347. This application Apr. 9, 1985, Ser. No. 721,478

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] E05B *47/00, 65/06;* E05C *1/06, 1/12*

U.S. Cl. 70—129 **2 Claims**



1. An electrically operated door locking system for use in a door mounted in a door jamb comprising:

a modular carrier frame mounted in said door jamb;

bolt means mounted on said carrier frame for reciprocation between a retracted position wholly enclosed within said housing and an extended position in which one end of said bolt means protrudes from said housing;

a bolt actuator cam slide operable for movement between a lock position and an unlock position for respectively positioning said bolt means in said extended position or said retracted position;

guide surfaces on said carrier frame for precluding horizontal movement of the bolt actuator cam slide;

solenoid means for selectively positioning said bolt actuator slide in its unlock or lock positons;

a control circuit for said solenoid means including circuit means for actuating said solenoid means to cause the bolt actuator slide to move to its lock position in response to movement of the door to closed position; and

means for preventing actuation of said solenoid means for moving said bolt to its lock position in response to said door not being in a fully closed position.

4,640,109

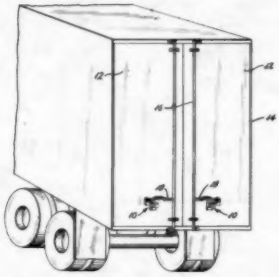
REMOVABLE LATCH HANDLE LOCKING DEVICE

John M. Schaublin, Rte. 7, Box 378 and Donna S. Schaublin, Rte. 4, Box 5215, both of Russellville, Ark. 72801

Filed Jun. 8, 1984, Ser. No. 618,671

Int. Cl.[4] G05G *5/00*

U.S. Cl. 70—202 **5 Claims**



1. In combination with a truck, trailer, rail car or the like having a cargo door with a latch and a latch handle movable between a first latched and a second unlatched position, a cylinder lock having an indexable body, a front rim having a diameter greater than that of said body, a lock cylinder and a cam lug pivotally mounted on said body opposite said front rim movable by said lock cylinder between a first receivable position inwardly of said body and a second position extending outwardly of said body, a locking device mounted to said door for engaging said latch handle when said latch handle is in its said first position and for receiving said cylinder lock when said cam lug is in its said first position, whereby said latch handle is retained in its said first position when said cam lug is moved to its said second position;

said locking device comprising:

(a) stationary slide box means having a first axial slideway;

(b) first lock receiving means in said slide box means in communication with said first axial slideway and having a diameter corresponding to that of said front rim;

(c) slide means slidable in said first axial slideway between a first and a second position;

(d) indexed second lock receiving means in said slide means alignable concentrically with said first lock receiving means in said slide box means when said slide means is in its said first position and having a diameter corresponding to that of said body;

(e) latch handle retaining means in said slide means having a second axial slideway slidably engageable over said latch handle when said latch handle is in its said first position and said slide means is in its said first position; and

(f) cam lug engaging means in said slide means in communication with said second lock receiving means and engageable by said cam lug when said slide means is in

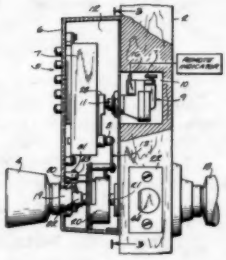
its said first position, said lock is received within said first and second index lock receiving means and said cam lug is in its said second position.

4,640,110

AUTOMATIC DELAY RELOCKING DEVICE

Aaron M. Fish, Rocky Mount, N.C.; Stanley S. Mazoff, Dollard des Ormeaux, Canada; Adamo M. D'Intino, Riviere-des-Prairies, Canada, and Hariharan Somasundaram, Montreal, Canada, assignors to Ilco Unican Corp., Rocky Mount, N.C.

Filed Sep. 16, 1985, Ser. No. 776,626
Int. Cl.[4] E05B *43/00, 13/10*
U.S. Cl. 70—269 10 Claims



1. A latching means comprising:

a permutation lock having a latch element;

a control element releasable for motion in one direction from a normal position responsive to proper decoding of the permutation lock;

a first rotatable clutch member connected to said latch element for retracting said latch element in response to rotation of said clutch member in one direction;

a second rotatable clutch member for transmitting such latch retracting rotation through said clutch member;

drive means providing a rotation transmitting connection between said clutch members which is disruptable upon movement of one of said member to an inactive position in a predetermined direction along an axis of rotation relative to the other clutch member;

connecting means connecting said control element with said first clutch member whereby rotary latch retracting motion of the latter is interfered with, except when the permutation lock has been properly decoded,

said drive means on said clutch members rendered ineffective by such interference with latch retracting rotation of the clutch member to move said member relative to the other to an inactive position;

a delayed relocking device having a retracted lock opening mode and an extended lock closed mode,

said connecting means normally biasing said delayed relocking device to a retracted position when moving in one direction,

means in said delayed relocking device biasing said device to an extended position in a predetermined time,

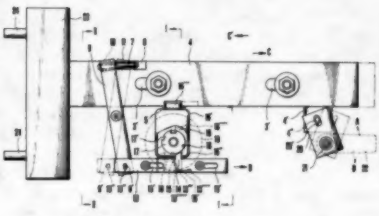
said delayed relocking device in the extended position interfering with movement of said linkage means in a second direction and causing said first clutch member to move relative to the other to its said inactive position, except for a predetermined time from the setting of the opening mode of said delayed relocking device.

4,640,111

LOCKING DEVICE FOR A DOOR ON SAFE OR THE LIKE APPARATUS

Masao Hashizume, Hiroshima, Japan, assignor to Kumahira Safe Co., Inc., Hiroshima, Japan

Filed Mar. 7, 1984, Ser. No. 587,251
Claims priority, application Japan, Nov. 21, 1983, 58-217908
Int. Cl.[4] E05B *37/00*
U.S. Cl. 70—314 16 Claims



1. A locking device for a door turnably mounted on a safe or the like comprising:

a numbering lock with a case having a cutout portion;

a movable plate for locking the door and having an engagement recess,

a locking bar fitted at one end of said plate and engaging said recess;

at least one locking rod extending from said bar to be inserted into a corresponding hole on the safe or the like during locking;

a lever plate operatively connected to said moveable plate;

a slidable pin, and spring means disposed on said slidable pin for connecting said moveable plate to said lever plate,

an actuating plate connected to said lever plate for movement with said lever plate within a specified extent;

a ratch member turnably supported on said actuating plate so that said ratch member moves with said actuating plate and projects into said cutout portion;

a plurality of tumblers for determining unlocking numbers for the numbering lock; and

engagement means provided on one of said tumblers for engaging with said ratch member wherein when said locking bar engages with said engagement recess, said ratch member causes at least one of said tumblers to rotate thereby locking the safe.

4,640,112

SECURITY DOOR KNOB AND ESCUTCHEON

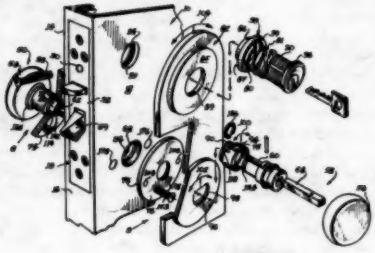
Raymond V. Kambic, Joliet, Ill., assignor to R. R. Brink Locking Systems, Inc., Plainfield, Ill.

Continuation of Ser. No. 521,118, Aug. 8, 1983, abandoned. This application Dec. 4, 1985, Ser. No. 805,253
Int. Cl.[4] A47B *35/04;* E05B *9/08, 15/02*
U.S. Cl. 70—452 10 Claims

1. A security door knob assembly for a door having an inner side and an outer side, and latch means, said assembly comprising: inner knob means and outer knob means; mounting means for mounting said inner and outer knob means to the respective inner and outer sides of said door so as to operate at least one associated latch means; said knob means being coupled to predetermined portions of said mounting means so as to be non-removable from the door except as a unit with said portions of said mounting means to which they are coupled; and securing means co-acting with said mounting means for preventing both disassembly and removal of either of said knob means or of said mounting means from said door, from either of the inner or outer sides thereof; said mounting means including an outer mounting plate non-rotatably mounted to a surface of the door and held thereagainst by fastener means, an outer bearing means rotatably coupled with said outer knob

means and threadably engaged with said outer mounting plate and at least one non-round outer surface portion on said bearing means said non-round outer surface portion on said bearing sleeve means including a generally cylindrical surface having at least one generally flat surface portion formed therein; escutcheon means overlying both said outer mounting plate and the fastener means and including an aperture through which said bearing means is received, said escutcheon aperture being of a complementary non-round configuration said through aperture defining an internal generally cylindrical surface portion having at least one generally flat surface portion formed therein and alignable with the generally flat surface portion of said bearing sleeve to effect non-rotatable engagement between said escutcheon means and said bearing sleeve means, such that said escutcheon, when fixed prevents rotation of said outer bearing means, with disengagement of said holding means freeing said escutcheon for rotation, such that said escutcheon may be used in a wrench-like manner to rotate said bearing means as required to disassemble or assemble said knob assembly; said holding means comprising a lock having a shoulder overlying said escutcheon means to prevent removal thereof and extending therethrough and into said door so as to be removable only from an edge surface of said door when said door is open.

2. A security door knob assembly for a door having an inner side and an outer side, and latch means, said assembly comprising: inner knob means and outer knob means, mounting means



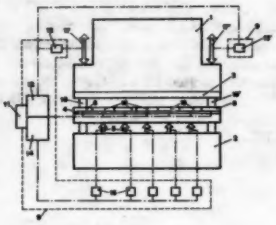
for mounting said inner and outer knob means to the respective inner and outer sides of said door so as to operate said latch means; and securing means co-acting with said mounting means for preventing both disassembly and removal of either of said knob means or said mounting means from said door, from either of the inner or outer sides thereof; wherein said mounting means comprises, a mounting plate secured to one of the sides of said door and bearing sleeve means threadably secured to said mounting plate and rotatably receiving one of said inner and outer knob means therethrough; and wherein said securing means includes at least one non-round outer surface portion on said bearing sleeve means, said non-round outer surface portion on said bearing sleeve means including a generally cylindrical surface having at least one generally flat surface portion formed therein, escutcheon means having a through aperture defining an internal surface of complementary configuration for engaging said bearing sleeve means surface, said through aperture defining an internal generally cylindrical surface portion having at least one generally flat surface portion formed therein and alignable with the generally flat surface portion of said bearing sleeve to effect non-rotatable engagement between said escutcheon means and said bearing sleeve means, such that said escutcheon means may be employed in a wrench-like manner to rotate said bearing sleeve means to effect engagement or disengagement of said bearing sleeve means with said mounting plate means, and holding means for releasably, non-rotatably securing said escutcheon means to said one side of said door.

4,640,113

SHEET-BENDING PRESS INCORPORATING A DEVICE FOR CONTINUOUS MONITORING OF THE BENDING ANGLE

Willem Dieperink, Buchillon, Switzerland, and Arend Vruggink, Harfsen, Netherlands, assignors to Beyeler Machines, S.A., Crissier, Switzerland

Filed Feb. 4, 1985, Ser. No. 697,870
Claims priority, application Switzerland, Feb. 3, 1984, 504/84
Int. Cl.[4] B21D *5/00*
U.S. Cl. 72—21 **12 Claims**



1. A press for bending sheet metal comprising an upper table and a lower table, one of which carries a punch, further comprising two means for actuating the movement of the punch and mounted on the punch, at least one means for compensating the deflection inherent in bending operations and mounted in one of the tables, and a bending device that continuously monitors the bending process and comprising:

(a) two pairs of measuring rods situated opposite the uprights of the press and at least one pair of measuring rods situated opposite the compensating means, the measuring rods being circular in section and longitudinally machined with a flat upper surface provided for supporting the workpiece, each of the measuring rods being seated in such a manner that it rotates with the bending of the workpiece, each pair of measuring rods being connected to a device for measuring the rotational angle of the measuring rods,

(b) a control device connected to the measuring devices, to the means actuating the movement of the punch, and to the compensating means, comprising:

a first means whereby the data provided by the measuring means is compared with a preset value;

a second means (13, 13') for controlling the means actuating the movement of the punch;

a third means for comparing the data provided by the various measuring devices, and for causing

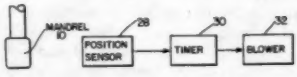
a fourth means (15) to control the compensating means so that a constant bending angle is obtained along the whole length of the workpiece.

4,640,114

AUTOMATED PROCESS FOR COLD WORKING HOLES

Madeline A. Kuless, Bethpage, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 29, 1985, Ser. No. 696,230
Int. Cl.[4] B21D *41/02*
U.S. Cl. 72—22 **1 Claim**



1. An automated method utilizing a multi-tool machine for

cold working the wall around a hole in a metal member, the method comprising:

drilling a plurality of holes in a workpiece;

serially feeding a plurality of memory metal alloy sleeves to the location of their respective holes from a feed track;

automatically positioning each sleeve within a respective hole, the outer diameter of each sleeve having a smaller outer diameter than the diameter of the hole;

driving a mandrel through the sleeve thus causing plastic expansion thereof which cold works the wall of the hole;

withdrawing the mandrel from the sleeve to complete displacement of the mandrel;

sensing the displacement of the mandrel;

initiating a timing cycle upon actuation of the sensing step;

subjecting the sleeve to a timed heat source located proximate the machine during said timing cycle thus thermally inducing the sleeve for a specific timed period, at a preselected temperature, for shrinking it; and

removing the sleeve from the hole thus permitting its recycling.

4,640,115

STRAIGHTENING DEVICE

Franz-Josef Hartmann, Paderborn, and Heinz Hefendehl, Altenbeken, both of Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,389

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424439

Int. Cl.[4] B21D *3/04*

U.S. Cl. 72—98 **14 Claims**

1. A straightening device for elongated round articles defining a center axis, particularly for rods or pipes, comprising a preparatory station for receiving the articles to be straightened, a driving unit having a plurality of driving rollers for engaging the articles in the preparatory station and consecutively advancing the articles in axial direction into a feeding station which guides in axial direction said articles into a straightening station, the straightening station being provided with driven inclined straightening rollers, said feeding station including a set of rotation symmetrical bodies arranged in spaced relation one after the other to engage discrete circumferential portions of respective articles exiting in axial direction from said driving unit, said rotation symmetrical bodies being supported for free rotation about axes which extend parallel to the center axis of the processed articles; said feeding station including two articulated conveying members arranged in a vertical plane below and above a feeding path for the processed articles, said rotation symmetrical bodies being arranged in pairs side by side and one after the other on respective conveying members, so as to surround the processed article over the entire length of the feeding station, said articulated conveying members being positively guided to circulate in the same axial direction and at the same speed as that of the advancing articles.

4,640,116

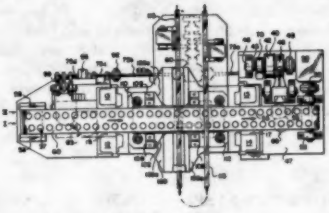
TWO-OUT BELT SYSTEM

Omar L. Brown, Dayton, Ohio, assignor to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Division of Ser. No. 610,446, May 15, 1984, Pat. No. 4,568,230. This application Sep. 3, 1985, Ser. No. 772,278

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—356 **2 Claims**



1. A method of maximizing the output of a single-acting press for producing can ends,

said press having a rectangular bed and crown and a slide reciprocably driven between the bed and crown, comprising

fitting said bed and slide with pairs of multi-station end tooling arranged progressively and centered from side to side of the press,

fitting said bed and slide with multi-station tab tooling arranged progressively from front to back of the press across the center of the end tooling,

feeding a strip of tab stock through the tab tooling and back to tab insert stations in the end tooling.

4,640,117

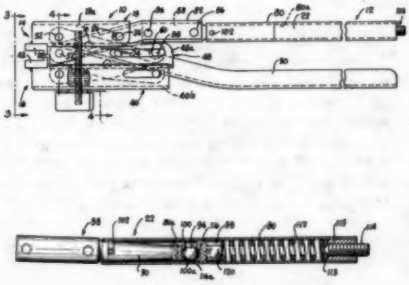
CRIMPING TOOL

J. Edward C. Anderson, Moreland Hills, and Merritt A. Osborn, Chesterland, both of Ohio, assignors to The Bares Group, Chagrin Falls, Ohio

Filed Jun. 29, 1984, Ser. No. 626,290

Int. Cl.[4] B21D *7/06*

U.S. Cl. 72—410 **5 Claims**



1. A plier type hand tool for squeezing, compressing, crimping or pressing, comprising:

(a) a pair of jaw assemblies including associated jaws movable towards and away from each other;

(b) a pair of handles for actuating said jaw assemblies;

(c) linkage means coupling said handles to said jaws such that movement of said handles toward each other produces squeezing movement in said jaw;

(d) at least one of said handles including:

(i) an extension forming part of one of said jaw assemblies;

(ii) a handle member pivotally connected to said extension;

(iii) said handle member including a spring biased slide element slidable within a portion of said handle member;

(iv) a detent means captured between said extension and said slide, said extension and slide defining confronting associated recesses when said extension and handle member are in a predetermined position;

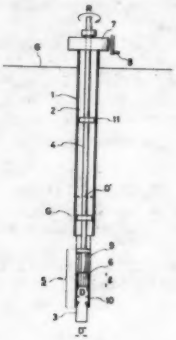
(v) said detent means being releasably captured between said recesses and operative to maintain said predetermined extension and handle member in said position until sufficient force is applied by said jaws to overcome the spring biasing force exerted by said slide on said detent means whereupon said handle member pivots with respect to said extension to provide a sensory indication that a predetermined force has been exerted by said jaws.

4,640,118

METHOD OF AND APPARATUS FOR MEASURING PILE SKIN FRICTION

Takao Kishida, and Takeo Fukaya, both of Yokohama, Japan, assignors to Toa Harbor Works, Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 768,085
Claims priority, application Japan, Aug. 23, 1984, 59-174052
Int. Cl.[4] G01N *19/02*
U.S. Cl. 73—9 **9 Claims**



1. A method of measuring the skin friction of a pile, comprising the steps of drilling a hole into the ground, inserting a casing pipe in said hole, then forming a bored hole below the leading end of the casing pipe, introducing a skin-friction measuring device having a cylindrical testing part in contact with the wall of said bored hole into the above formed bored hole, rotating said cylindrical testing part of said skin-friction measuring device with a boring rod connected to said cylindrical testing part and extending upward through said casing pipe and out the upper end thereof, and determining the friction force generated between said cylindrical testing part and said wall of said bored hole in the ground by the torque required for the rotations of said cylindrical testing part.

4,640,119

UTILITY POLE TESTER

Frank Ludwig, Richmond, Mich., assignor to P.T.E. Inc. and American Energy Services, Inc., both of Richmond, Mich.

Filed Jul. 5, 1985, Ser. No. 752,130
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—12 **12 Claims**

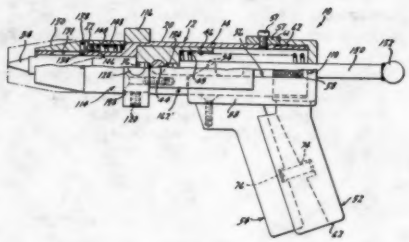
1. A portable testing apparatus for determining the degree of degradation of metal surface, said testing apparatus comprising:

an elongated housing having a bore extending longitudinally therethrough;

removable closure means closing one end of said bore;

piston means movably disposed within said bore, said piston means including an impacting portion removably secured to said piston means and movable into and out of said housing, said impacting portion being operative to impact said metal surface to be tested;

biasing means operative to urge said piston means in a forward direction whereby said impacting portion extends outwardly of said housing;



handle means secured to said housing, said handle means including trigger means operative when in a first position to retain said piston means in a rearward position within said housing and when moved to a second position to release said piston whereby said biasing means may operate to drive said piston forwardly with respect to said housing so as to cause said impacting portion to impact said metal surface with a predetermined force.

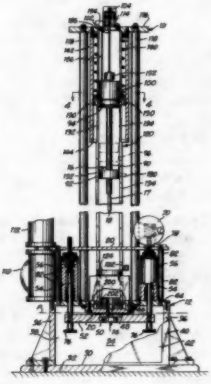
a nose cone assembly longitudinally movably secured to said housing, said nose cone assembly being operative to surround and protect a part of said impacting portion projecting outwardly of said housing when said pisotn is in a forward position.

4,640,120

IMPACT TESTING APPARATUS

Ronald F. Garritano, Flemington; John J. O'Connor, Roselle Park, and Manuel E. Papayanopulos, Elizabeth, all of N.J., assignors to Rheometrics, Inc., Piscataway, N.J.

Filed Jun. 21, 1985, Ser. No. 747,646
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—12 **25 Claims**



1. In testing apparatus for determining impact characteristics of a test specimen placed at a prescribed location in a testing

station, the test specimen being subjected to impact by a test element traveling under free-fall at a predetermined velocity and level of kinetic energy, the improvement comprising:

holding means for holding the test specimen at the prescribed location in the testing station;

impact means carrying said test element and moveable between a first position located at the testing station and a second position spaced above the testing station;

elevating means for elevating the impact means and the test element from the first position to the second position to impart potential energy to the impact means related to the height of the second position above the first position;

coupling means for coupling the impact means with the elevating means;

supplemental energy-input means responsive to movement of the impact means beyond an intermediate position located between the first position and the second position, during movement of the impact means in the direction from the first position toward the second position to impart additional energy to the impact means;

guide means for guiding the impact means for elevation by the elevating means between the first position and the second position and for essentially free-fall between the intermediate position and the first position; and

control means for determining the height of the second position above the first position and above the intermediate position, said height being determined by the total energy available to the impact means to provide the predetermined velocity and level of kinetic energy in the impact means at the testing station, said control means being coupled to the coupling means for operating the coupling means to release the impact means at the second position for downward movement and essentially free-fall between the intermediate position and the first position, whereby the test element will impact the test specimen during free-fall and at the desired predetermined velocity and level of kinetic energy.

4,640,121

METHOD FOR FINDING A LEAK IN PRESSURE-CARRYING VESSELS AND APPARATUS FOR CARRYING OUT THE METHOD

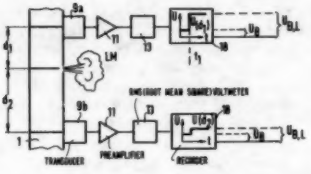
Wilhelm Leuker, Gosberg; Günter Stipsits, Neunkirchen/Brand, and Bernhard Thiel, Forchheim, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,864

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336245

Int. Cl.⁴ G01M *3/24*

U.S. Cl. 73—40.5 A **18 Claims**



1. Method for determining the location of a leak in pressure-carrying vessels, including a plurality of probes spaced-apart on walls of the vessels for picking up high-frequency solid-conducted sound noises, and an amplifier connected to the probes, which comprises determining the solid-conducted sound noises by comparing with a background noise averaged over at lest ten minutes, forming an r.m.s. value in the amplifier from the sound noises, comparing the r.m.s. value with a threshold value, issuing a signal if the r.m.s. value exceeds the threshold value, comparing the solid-conducted sound noises from at least two probes with each other for localizing the leak, placing the r.m.s. value of the solid-conducted sound noises in a relationship relative to the spacing between the probes based on the comparison, and determining the location of the leak as the location of the maximum solid-conducted sound noise from the relationship.

4,640,122

APPARATUS FOR LEAK TESTING AT LEAST ONE WALL PORTION AND/OR A VOLUME DELIMITED BY SAID WALL PORTION, AND A METHOD OF DETERMINING OPTIMUM PARAMETERS FOR SAID LEAK TESTING

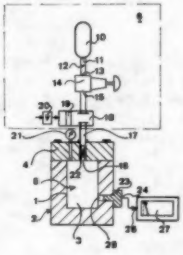
Roger A. Héraud, Orsay, and Jacques Amiel, Clamart, both of France, assignors to Societe de Traitement Automatique—Controle et Etancheite "T R A C E" , Fresnes, France

Filed Sep. 10, 1985, Ser. No. 774,494

Claims priority, application France, Sep. 10, 1984, 84 13827; Jul. 22, 1985, 85 11153

Int. Cl.⁴ G01M *3/32*

U.S. Cl. 73—49.2 **16 Claims**



1. In an apparatus for leak testing at least a portion of the wall of a part, and/or for leak testing a volume, the apparatus comprising:

means cooperating with said wall or volume to be tested to constitute an enclosure and including means for conveying a reference gas into said enclosure;

means for cooling said gas inside said enclosure; and

means for measuring the pressure of said gas inside said enclosure;

the improvement whereby said means for cooling said gas inside said enclosure comprises at least one nozzle and said nozzle is connected in series with said means for conveying the reference gas to the enclosure.

4,640,123

LEAK DETECTING DEVICE

Haruo Imaizumi, Nishi-Asuma, and Satoru Kobayashi, Hitaka, both of Japan, assignors to Junkosha Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,456

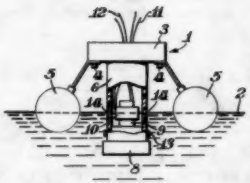
Claims priority, application Japan, Aug. 29, 1984, 59-181262

Int. Cl.⁴ G01N *27/00*

U.S. Cl. 73—61.1 R **3 Claims**

1. A leak detecting device comprising a detecting element contained in a suitable housing and submerged at least partially in water for detecting the leakage of a substance different from said water, and a vibrator disposed in the vicinity of said de-

tecting element for applying periodic vibrations to said detecting element at a suitable frequency, wherein said detecting



element is arranged on the outer surface of a column-shaped vibrator.

4,640,124

TECNOSCOPES

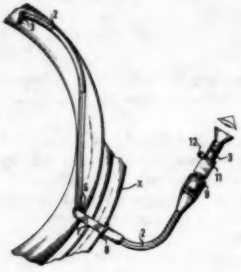
Jörg Diener, Oberderdingen, and Ehrenfried Bitrolf, Knittlinger-Kleinvillars, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Feb. 4, 1985, Ser. No. 697,623

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1984, 3405541

Int. Cl.[4] G02B *23/26*

U.S. Cl. 73—116 **8 Claims**



1. A technoscope for internal inspection of power plants and the like by insertion through a wall port thereof, said technoscope comprising:

a rigid first guide shaft of non-circular cross-section for insertion in said wall port, said shaft having a distal end equipped with a lateral outlet adjacent the distal end;

a flexible second guiding element being pass through said first guide shaft with a sliding fit and extend out of said lateral outlet, said second guiding element having a deflectable distal end portion, a proximal end portion with a control system for controlling deflection of said distal end portion and an axial intermediate portion whose cross-section is complementary with the internal cross-section of the first guide shaft, said second guiding element having an axial passageway extending therethrough; and

a separate flexible endoscope being slideable received in said axial passageway with a distal end of the flexible endoscope extending pass said distal end of the second guiding element.

4,640,125

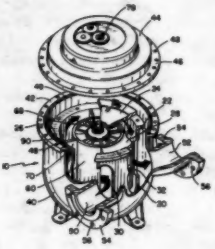
ROTARY METERING DEVICE USEFUL WITH ABRASIVE FLUIDS

Frank Carpenter, Lake Charles, La., assignor to Lake Charles Instruments, Inc., Lake Charles, La.

Filed Apr. 8, 1985, Ser. No. 721,075

Int. Cl.[4] G01F *3/04*

U.S. Cl. 73—259 **13 Claims**



1. An apparatus useful for measuring the flow of abrasive fluids through a pipe, comprising:

a cylindrical housing having inlet and outlet ports through which the flow of a fluid may be directed;

a cylindrical rotor body mounted within said housing for rotation about an axis parallel to the axis of said housing;

a flow channel through said housing between said inlet and outlet ports defined by the exterior of said rotor body and the interior of said housing;

a plurality of slots through the cylindrical surface of said rotor body, wherein said slots are disposed symmetrically about said rotor body and parallel to the axis of said rotor body, wherein the exposed surfaces of said slots formed by said rotor body comprise a metal of high wear resistance and wherein the hardness of said metal is between 40 and about 70 on the Rockwell C hardness scale;

a plurality of blades mounted for shuttle movement transversely of said flow channel and through said slots wherein the hardness of the surface of said blades opposing the exposed surfaces of said slots is between about 40 and about 70 on the Rockwell C hardness scale and less than the hardness of said metal; and

means for moving said blades through said slots as said rotor body rotates to repetitively produce a measuring chamber of predetermined volume within said flow channel.

4,640,126

DEVICE FOR MEASURING OIL LEVEL IN AN INTERNAL COMBUSTION ENGINE

Peter A. G. Jänsch, Gothenburg, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed May 20, 1985, Ser. No. 735,732

Claims priority, application Sweden, May 21, 1984, 8402722

Int. Cl.[4] G01F *23/04*

U.S. Cl. 73—290 R **1 Claim**

1. An oil level meter for an internal combustion engine comprising:

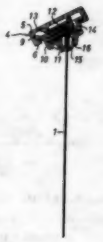
a measuring tube communicating with an oil reservoir in said engine;

a cap for covering an open end of said measuring tube, said cap including a cover formed for connection to said measuring tube; a sealing cover formed with an inner spherical bearing surface; said measuring tube cover and said sealing cover having means for securing said covers together while allowing limited axial movement therebetween; and a sealing member associated with said sealing cover for engaging the open end of said measuring tube;

a bearing washer with a spherical bearing surface and a compression spring biased between the inside of the mea-

suring tube cover and one side of the bearing washer; said compression spring urging said sealing cover and said sealing member toward engagement with said open end of said measuring tube;

a rigid oil dipstick; and



a bearing ball rigidly connected at one end of said dipstick and located between the spherical bearing surfaces of the bearing washer and the sealing cover and under urging of said compression spring articulately connect said cap and said dipstick, thereby forming a ball joint allowing the cap to tilt in all directions relative to the dipstick.

4,640,127

ELECTROTHERMAL MEASUREMENT OF LEVELS COMPENSATED FOR AMBIENT TEMPERATURE

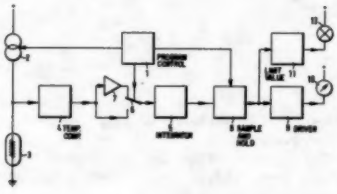
Dieter Schneider, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed May 1, 1985, Ser. No. 729,493

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423802

Int. Cl.[4] G01F *23/24*

U.S. Cl. 73—295 **7 Claims**



1. A method for electrothermal measurement of liquid level, which measurement is compensated for ambient temperature and employs a resistance probe heated with a constant current during a heating time of predetermined duration, the method further employing means for timing the heating of the probe to provide a first variable derived from at least one probe voltage at the start of the heating time, said first variable being compared in the method with a second variable which is derived from at least one probe voltage at the end of the heating time in order to form a comparison variable which is approximately proportional to the liquid level, the method providing for the forming of at least one of the variables in accordance with a time function, the improvement wherein the method further comprises:

integrating a probe voltage from the start of the heating time until the middle of the heating time to reduce the effect of disturbance such as noise, etc., on the measurement;

forming the first variable from the integration of the probe voltage from the start of the heating time until the middle of the heating time;

integrating the probe voltage from the middle of the heating time until the end thereof to reduce the effect of the noise, etc., disturbances on the measurement;

forming the second variable from the integration of the probe voltages from the middle of the heating time until the end thereof; and

substracting the two variables to form the difference between the first variable and the second variable, the difference being a measure of the liquid level.

4,640,128

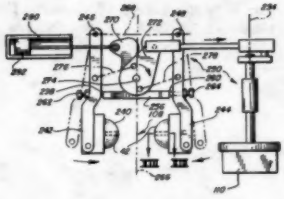
MECHANISM FOR PROPER ALIGNMENT OF SENSOR PROBES WITH FLUID SAMPLE CHAMBER

Terry D. Lewis, Aptos, Calif., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 20, 1984, Ser. No. 683,989

Int. Cl.[4] G01D *3/04, 21/00;* G01N *9/24*

U.S. Cl. 73—866.5 **22 Claims**



1. In a biological fluid sensor apparatus for sensing fluid in a sample chamber, an apparatus for correctly aligning a pair of sensor probes relative to a sample chamber location, comprising:

a pair of arms for carrying the pair of sensor probes;

means for mounting the arms for movement of the probes toward one another;

means for blocking the arms from movement toward one another beyond a preselected limit; and

means for moving said arms into blocking engagement with said blocking means.

4,640,129

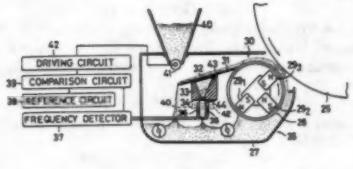
METHOD AND APPARATUS FOR DETECTING TONER CONCENTRATION OF TWO-COMPONENT DRY DEVELOPER

Selichi Miyakawa, 1346 Kagawa, Nagareyama-shi, Chiba; Susumu Tatsumi, 17-9 Hinodai 5-chome, Hino-shi, Tokyo, and Koji Sakamoto, 9-14 Chuoh 1-chome, Ohta-ku, Tokyo, all of Japan

Continuation of Ser. No. 362,497, Mar. 26, 1982, abandoned, which is a continuation of Ser. No. 156,411, Jun. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 881,853, Feb. 27, 1978, abandoned. This application Apr. 22, 1985, Ser. No. 726,166

Int. Cl.[4] G01N *11/06;* G03G *9/10*

U.S. Cl. 73—866 **12 Claims**



1. A method of detecting the active toner concentration of a two-component developer comprising a mixture of carrier particles and toner particles including active and fatigued toner

for use in an electrostatic copying apparatus comprising the steps of:

changing the concentration of active toner in said developer according to a predetermined pattern and measuring the flow rate of said developer for each concentration of active toner to obtain the relationship between the flow rate and the active toner concentration of said developer;

measuring the flow rate of said developer when its active toner concentration is unknown; and

determining the unknown active toner concentration of said developer from the measured flow rate and from the predetermined relationship between the flow rate and the active toner concentration of said developer.

4,640,130

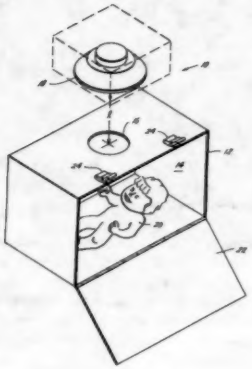
METHOD AND APPARATUS FOR ACOUSTICALLY MEASURING THE VOLUME OF AN OBJECT

Hwai-Ping Sheng, Bellaire; Cutberto Garza, Houston; Dean C. Winter, Houston, and William G. Deskins, Houston, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Oct. 29, 1984, Ser. No. 665,800

Int. Cl.[4] G01N *29/00*; G01F *17/00*

U.S. Cl. 73—579 **8 Claims**



1. An apparatus for measuring the volume of an object comprising:

a container adapted to receive the object to be measured and having gas therein, said container having an opening;

variable frequency means positioned for producing periodic pressure fluctuations at the mouth of the opening;

means for measuring the resonance frequency in the container; and

wherein said pressure fluctuation producing means is mechanically uncoupled from the opening so that a uniform and normal pressure wavefront impinges on the opening.

4,640,131

METHOD AND APPARATUS FOR THE ULTRASONIC TESTING OF BOLTS WITH A WALL THICKNESS DISCONTINUITY

Michael Kröning, Röttenbach; Georg Hölzler, Möhrendorf, and Roland Heumüller, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

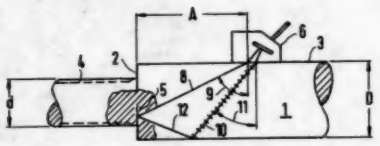
Filed Apr. 11, 1985, Ser. No. 722,298

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414362

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—600 **3 Claims**

1. Method for the ultrasonic testing of bolts for incipient cracks emanating from a wall thickness discontinuity between thinner and thicker parts of the bolt, which comprises placing an ultrasound transmitter and receiver in the form of a piezoelectric transducer on the periphery of the thicker part of the bolt with the discontinuity located in the near-field region, radiating longitudinal waves at an angle of 55° to 70° and transversal waves at an angle of 25° to 35° from the transducer



in direction toward the discontinuity, and comparing the intensity of reflected transversal and longitudinal waves with an echo characteristic obtained from a test body corresponding to the bolt to be tested, having slots formed therein simulating incipient cracks of different depths.

4,640,132

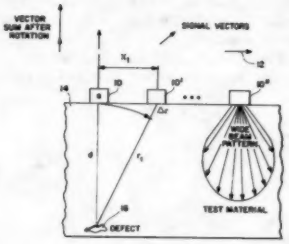
ENHANCEMENT OF LINEAR SCAN ULTRASONICS

John H. Flora, and Thomas Powers, Jr., both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 15, 1985, Ser. No. 691,599

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—602 **2 Claims**



1. A method for the ultrasonic testing of a course-grained material, comprising:

transmitting ultrasonic waves into the material to produce reflected signals which are characteristic of internal structures of the material;

detecting the reflected signals at a plurality of spaced locations distributed along a known scan path over the material;

storing the detected reflected signal for each location;

for each individual location, multiplying the stored detected reflected signal for each other location by a corrective phase shift factor which is characteristic of a time delay for the detected reflected signal from the other locations to the individual location, to obtain a rotated reflected signal for each other location; and

for each individual location, adding the rotated reflected signal for each other location to the reflected signal for the individual location to form a composite signal, designated ST_a, indicative of internal structures in the material, which equals:

$$\sum_{i=-N}^{N} (S_{a+i})(e^{j2K(d2+X(2)k)})$$

wherein N is the number of locations before an individual location a, N' is the number of locations after position a,

S_{a+i} is the reflected signal at each position a+i, i being a number designating each individual location, X_i is the distance between each adjacent location along the scan path, and d being the depth from a surface of the material to the internal structure which causes the reflected signal.

4,640,133

ULTRASONIC TESTING DEVICE PROVIDED WITH A ROLLING MEANS

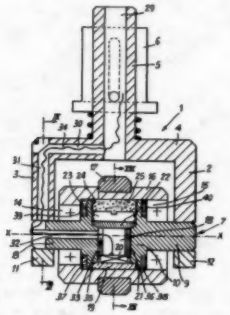
Daniel Lecuru, Puteaux, and Jean-Pierre Choffy, Rueil-Malmaison, both of France, assignors to Aerospatiale Societe National Industrielle, Paris, France

Filed Apr. 15, 1986, Ser. No. 852,125

Claims priority, application France, Apr. 17, 1985, 85 05826

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—639 **8 Claims**



1. In an ultrasonic testing device of the type comprising a fixed hub with at least one ultrasonic transducer as well as an annular rolling means having an inner face and mounted for rotation on said hub and surrounding said transducer, this latter being mounted on the hub through a support whose external face, opposite said transducer, defines with the inner face of said rolling means a rotational sliding slit, coupling between said support and said rolling means being provided by an ultrasonic coupling liquid present in said slit, there is further provided a spongy resilient element imbibed with said coupling liquid, said element being housed in a recess in said hub and being applied resiliently against the inner face of said rolling means.

4,640,134

APPARATUS AND METHOD FOR ANALYZING ACOUSTICAL SIGNALS

James A. Simmons, Eugene, Oreg., assignor to Bio-Dynamics Research & Development Corporation, Eugene, Oreg.

Filed Apr. 4, 1984, Ser. No. 596,523

Int. Cl.⁴ G01H *3/08*; G01R *23/165*

U.S. Cl. 73—648 **14 Claims**

1. Apparatus for analyzing an acoustical signal having a plurality of signal components extending over a band of signal frequencies, comprising:

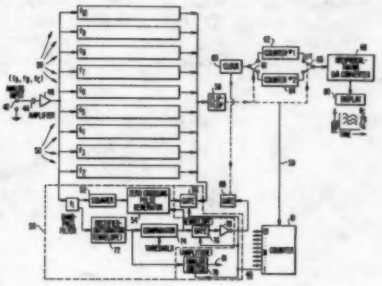
means for separating an acoustical signal into a plurality of sub-bands;

means for measuring the time period between successive zero-crossings of signal components in each of said sub-bands;

reciprocal means for extracting the reciprocal of the zero-crossing time periods of signal components in each of said sub-bands;

display means for simultaneously displaying the time period reciprocals of signal components in each of said sub-bands; and

means for sequentially scanning each of said sub-bands for the presence of a signal component therein, for causing a zero-crossing time period measurement to be made if said signal component is present in the selected sub-band, and



for advancing to the next sub-band if no such signal component is present.

4,640,135

SENSOR

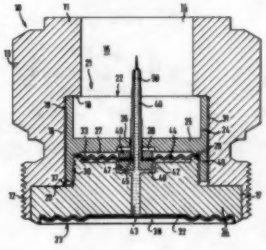
Walter Kästel, Steinen, and Wolfgang Geiger, Schopfheim, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,282

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1984, 3422945

Int. Cl.⁴ G01L *7/08*

U.S. Cl. 73—716 **12 Claims**



1. A sensor comprising a housing having at least two diaphragms supported therein which enclose a volume filled with hydraulic fluid, one of said diaphragms having an opening, and a narrow tube connected to said diaphragm with the opening in a fluid tight manner around the edge of the opening to permit hydraulic fluid to be introduced into the volume and for serving as a force-transmitting or travel-transmitting member for connecting the diaphragm with the opening to a force or travel sensor.

4,640,136

METHOD FOR THE PROCESSING OF MEASUREMENT DATA IN A GAS FRICTION VACUUM METER AND A GAS FRICTION VACUUM METER EQUIPPED WITH A CIRCUIT FOR THE PRACTICE OF THIS METHOD

Lothar Schmidt, Kerpen-Sindorf, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 11, 1984, Ser. No. 680,378

Claims priority, application European Pat. Off., Dec. 17, 1983, 83112728.7

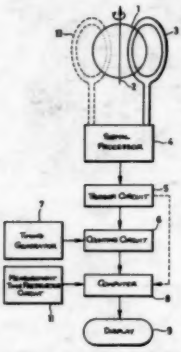
Int. Cl.⁴ G01L *9/00*

U.S. Cl. 73—753 **6 Claims**

1. A method for measurement value processing in a gas

friction vacuum meter, in which the pressure value is determined by the drag on a magnetically suspended free ball, comprising:

forming a first time value t_{n-1} by measuring the time of N/2 periods of revolution of the ball and a second time value by directly following measurement of the time t_n of additional N/2 periods of revolution of the ball, comparing the



two time values to determine a pressure value, repeating this pressure value determination from two time values after each period of revolution for the same number of N periods of rotation of the ball to a total of Z determinations, and displaying the average of the Z-times-determined pressure value, N:Z being as at least one of 3:1, 4:1 and 5:1.

4,640,137

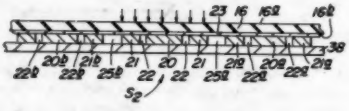
TACTILE SENSOR

Michael W. Trull, Cary, and Richard C. Powell, Apex, both of N.C., assignors to Lord Corporation, Erie, Pa.

Filed May 31, 1985, Ser. No. 739,676

Int. Cl.[4] G01D 7/02; H01C 10/10

U.S. Cl. 73—862.04 **30 Claims**



1. A tactile sensor for identifying the magnitudes and locations of pressures applied substantially contemporaneously thereto at a plurality of locations thereon, comprising:

a resilient platen having upper and lower surfaces;

a plurality of laterally spaced pressure sensing sites underlying said lower surface;

each of said pressure sensing sites including emitter electrode means and companion collector electrode means surrounding said emitter electrode means in spaced relation therewith;

flexible conductive means on said lower surface of said platen overlying said pressure sensing sites and cooperable therewith when said platen is deflected downwardly against a selected site to receive current emitted from said emitter electrode means and to conduct to said companion collector electrode means substantially all of the current flowing into the conductive means from said emitter electrode means; and

control means for measuring, and for determining the locations of said sites constituting the source of, the current conducted from said emitter electrode means to said collector electrode means at each of said sites.

4,640,138

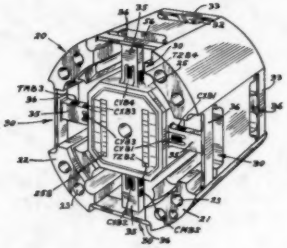
MULTIPLE AXIS LOAD SENSITIVE TRANSDUCER

Richard A. Meyer, Carver, and Anthony E. Lowe, Eden Prairie, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Mar. 6, 1985, Ser. No. 708,596

Int. Cl.[4] G01L 5/16

U.S. Cl. 73—862.04 **7 Claims**



1. A load transducer for measuring loads in a plurality of axes including means forming an outer housing;

means for attaching said outer housing to a first member;

a hub located substantially within said outer housing and being adapted to carry a second member;

first and second spiders joining said hub to said outer housing, each spider comprising a plurality of support arms spaced substantially 90° apart and extending substantially radially from said hub, the support arms of each spider being aligned in a separate spider plane generally perpendicular to a reference central longitudinal axis through the outer housing, said spiders being spaced apart from each other along the central longitudinal axis;

separate strap means for joining the outer ends of each of said support arms to said outer housing comprising flexure beams which are integrally supported on the housing at the opposite ends of the flexure beams and integrally joined to respective ends of the support arms, said flexure beams having planes parallel to the central longitudinal axis and having beam longitudinal axes, said flexure beams being flexible to deflect under loads between said outer housing and hub tending to twist the flexure beams about the beam longitudinal axis and under loads acting perpendicular to the planes of the flexure beams, and carrying substantial loads in directions parallel to the plane of the flexure beams;

means to individually measure strain in each of said support arms when said hub is loaded relative to the outer housing, said strain being measured in a direction along said central longitudinal axis, and in at least two mutually perpendicular directions lying in each of said spider planes, and said means to measure strain including means to sense loads in said support arms caused by rotational loads about said central longitudinal axis between said outer housing and said hub; and

said housing, said hub, said support arms of said spiders and said flexure beams being formed as an integral unit from a single block of material with no individual separable pieces.

4,640,139

STRAIN GAUGE DEVICE FOR MEASURING MULTICOMPONENT FORCES AND TORQUES

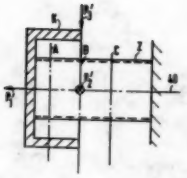
Harald Fritz, Waldbronn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 634,970, Jul. 27, 1984, abandoned. This application May 21, 1986, Ser. No. 868,189

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327141; Feb. 20, 1984, 3406059

Int. Cl.[4] G01L *5/16*

U.S. Cl. 73—862.04 11 Claims



1. A device for use in the measurement of multicomponent forces and torques, said device connectable to a current supply, computing means being connectable to said device for calculating, in response to electrical signals therefrom orthogonal components of a composite unbalanced force and orthogonal components of a composite torque acting on said device, said device comprising:

an elastically and substantially uniformly deformable body in the form of a hollow cylinder firmly clamped at one end and rigid at an opposite end with a force introduction cup partially surrounding said cylinder;

a multiplicity of wire strain gauges mechanically attached to said deformable body and electrically connected at one end to each other, said gauges being operatively connectable to the current supply and to the computing means for supplying to said computing means voltages partially determined by the magnitudes and directions of the composite unbalanced force and composite torque acting on the device and partially determined by the respective positions and respective orientations of said gauges with respect to said body, said gauges being disposed about said deformable body at positions and orientations so that sufficient number of equations are available for use by said computing means to calculate each component of the composite unbalanced force and each component of the composite torque acting on the device, said gauges including at least seven gauges mounted on said cylinder in at least two parallel planes extending substantially transversely to an axis of symmetry of said cylinder, said cup having a rim defining one of said planes, said seven gauges including a first pair of gauges oriented parallel to said axis and perpendicularly to said planes and disposed on diametrically opposed sides of said cylinder, said seven gauges further including a second pair of gauges lying in said planes in a circumferential direction with respect to said cylinder and disposed on diametrically opposed sides of said cylinder from one another, said seven gauges further including at least a third pair of gauges inclined at substantially 45° to said planes and substantially 90° with respect to one another.

4,640,140

AEROSOL SAMPLER WITH CASCADE IMPACTION AND UNIFORM DEPOSITION

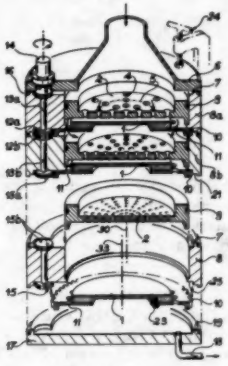
Patrick Burghoffer, Lognes; Michel Pourprix, Montlhery, and Patrick Poussier, Vincennes, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 21, 1984, Ser. No. 684,864

Claims priority, application France, Dec. 23, 1983, 83 20697

Int. Cl.[4] G01N *1/24*

U.S. Cl. 73—863.22 9 Claims



1. An apparatus of the aerosol sampler type with cascade impaction and uniform deposition comprising a conical air inlet fixed to a tight, hollow, cylindrical chamber of revolution constituted by the superimposing of several stages in the form of hollow cylinders of revolution traversed by the air flow from the conical inlet and each having a circular plate perforated with holes located on concentric circles coaxial to said plate and having an identical diameter progressively decreasing in each stage, as well as a collection disk located downstream of the perforated plate and whose diameter is smaller than the internal diameter of the impacter chamber, incorporating means for ensuring the vertical downward circulation of the air and means for the relative rotation of each perforated plate with respect to the corresponding collection disk, wherein in each stage, the axis of rotation of the disk passes through the disk and is offset relative to the axis of the circular perforated plate.

4,640,141

GEARBOX-TRANSMISSION WITH SYNCHRONIZED REVERSE-GEAR

Gunter Knödel, Mühlacker, and Georg Helms, Ludwigsburg, both of Fed. Rep. of Germany, assignors to GETRAG Getriebe- und Zahnradfabrik GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,077

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320494

Int. Cl.[4] F16H *3/08*

U.S. Cl. 74—357 5 Claims

1. A gearbox-transmission for motor vehicles, comprising:

a first shaft;

a second shaft arranged in parallel to the first shaft;

a first gearwheel fixed to the first shaft;

a second gearwheel rotatably mounted to the second shaft and engaging the first gearwheel;

means for fixing the second gearwheel to the second shaft to provide a first forward gear;

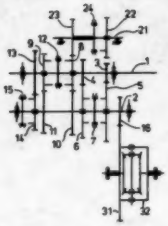
a third gearwheel rotatably mounted to the first shaft;

a fourth gearwheel fixed to the second shaft and engaging the third gearwheel;

means for fixing the third gearwheel to the first shaft to provide a second forward gear;

a third shaft arranged in parallel to the first shaft;

a fifth gearwheel rotatably mounted to the third shaft and in driving connection with the first gearwheel;



a sixth gearwheel rotatably mounted to the third shaft and in driving connection with the fourth gearwheel; and

means for connecting the fifth gearwheel and the sixth gearwheel to provide a reverse gear.

4,640,142

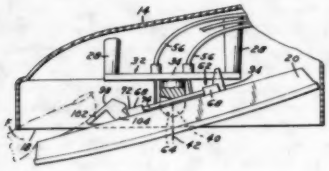
ADJUSTABLE AUTOMOBILE MIRROR SYSTEM

Michael Cummins, Mount Clemens; James M. Cummins, Warren, and Raymond A. Theys, Clawson, all of Mich., assignors to NI Industries, Inc., Long Beach, Calif.

Filed May 12, 1983, Ser. No. 493,934

Int. Cl.⁴ F16C *1/10*

U.S. Cl. 74—501 R **27 Claims**



1. In a remotely controlled mirror system of the type including a mirror anchored to a mirror retainer whose position is universally adjustable relative to a mirror housing by means of a cable linkage interconnecting the mirror retainer with a control unit, the improvement comprising:

a pivot boss on a longitudinal pivot axis mounted upon the housing and having a mounting head;

a pivot block having a socket element receiving and movably mounted upon said head;

said block being held in abutting and pivotal contact by the tension of the cable linkage exerting a force pulling the block towards and against said head;

pin and slot means between said block and head, constraining said block from movement in a plane through said block; and

resilient detent means on said mirror retainer receiving and retainingly engaging said pivot block for universal movements therewith;

said detent means being yieldable to facilitate selective assembly of said mirror retainer on and disassembly from said pivot block;

said mirror retainer defining a polygonal recess adjacent said detent means;

said pivot block being of a size and shape to substantially fill said recess; and

said pivot block being retained in said recess by said detent means.

4,640,143

SELF-LOCKING DIFFERENTIAL WITH HEXAGONAL DRIVE ROD

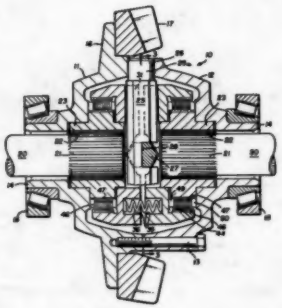
Carl E. Schou, 1438 Lone Pine Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 371,034, Apr. 22, 1982, Pat. No. 4,498,355. This application Feb. 7, 1985, Ser. No. 698,996

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.⁴ F16H *35/04*

U.S. Cl. 74—650 **3 Claims**



1. A differential assembly, self-releasing locking means for connecting and disconnecting the end portions of each of a pair of axially aligned, conventional axle-like shafts to a conventional power rotated housing which contains said end portions, comprising:

a diametrically arranged, hexagonal cross-section, drive rod housed between the adjacent shaft end portions and having its outer ends fixedly connected to the housing for rotating therewith;

a pair of closely spaced apart, opposing coupling rings in axial alignment with and surrounding bushing-like hubs mounted upon the shaft end portions;

pairs of aligned, adjacent V-shaped notches formed in the facing ends of the coupling rings with the drive rod radially extending through the V-shaped notches, and with the V-shaped notch forming walls being parallel to and slightly spaced from their adjacent rod faces;

said drive rod being positioned between said coupling rings and having opposed lead faces which are perpendicular to the plane of rotation of said drive rod;

a clutch means releasably interconnecting each of the coupling rings to the bushing-like hub which said ring surrounds, said clutch means being engaged by axially outwardly directed pressure caused by movement of the coupling ring away from the opposite coupling ring, and said clutch means being disengaged upon release of the ring pressure due to movement of the ring inwardly towards the opposite coupling ring, and each of said clutch means including a series of interleaved ring-like clutch plates surrounding a shaft end hub, and being surrounded by a coupling ring, and with alternate plates being spline connected to the coupling ring and to the hub, with the interleaved clutch plates being relatively axially movable together into engaging surface to surface contact for locking and being movable apart from each other for unlocking in response to corresponding movement of their coupling ring;

said drive rod including a pair of opposed side walls associ-

ated with each lead face, each drive rod side wall forming a pressure angle "A" with respect to its associated lead face with angle "A" being defined as follows:

$$\text{Tan } A \geq \frac{r}{R \times N \times U}$$

A=pressure angle
r=outer radius of coupling rings
R=mean radius of clutch means
N=number of friction surfaces on clutch plates
U=coefficient of friction for friction surfaces

whereby during normal powered rotation of the housing, the drive rod rotates with the housing and engages the V-shaped notch forming walls that are in its path of rotation for rotating the coupling rings and simultaneously, for wedging the V-shaped notch forming walls apart, causing the coupling rings to move axially apart and to apply axially outwardly directed pressure upon the clutch means to thereby lock the hubs and shaft end portions to the housing for rotation therewith; but when either of the shafts rotate faster than the rotation of the housing, the coupling ring of that shaft angularly moves forwardly relative to the drive rod so as to disengage the rod from the notch forming walls for that coupling ring resulting in that coupling ring moving inwardly towards the opposite coupling ring and releasing its pressure upon, and consequently unlocking, its clutch means so that its shaft may free wheel relative to the housing;

and stop means connecting the coupling rings for limited relative angular movement of one coupling ring relative to the other so that during the times that the drive rod is disengaged from the notch forming walls in the path of its direction of rotation, the rod is roughly centered within the walls forming such notches, and said stop means being formed of a number of pins, each having one end secured to one of the coupling rings, and its opposite end extending towards and loosely fitting into a socket formed in the other coupling ring, with the degree of looseness corresponding to the permissible angular movement of one ring relative to the other for centering the drive rod within the notches of one ring, and coil springs means arranged between and normally spring pressing the two coupling rings apart in the axial direction for normally tending to move the rings axially away from the rod and into position for applying pressure to their respective clutch means for engaging the clutch means.

4,640,144

MOTION INTERCONVERSION APPARATUS

Martin McLendon, 11173 Kelowna St., San Diego, Calif. 92126

Filed Aug. 12, 1985, Ser. No. 764,795
Int. Cl.[4] F16H *25/12*
U.S. Cl. 74—56 **9 Claims**

1. Apparatus for interconversion of reciprocal and rotary motion comprising:

an axle having a longitudinally extending axis;

a housing;

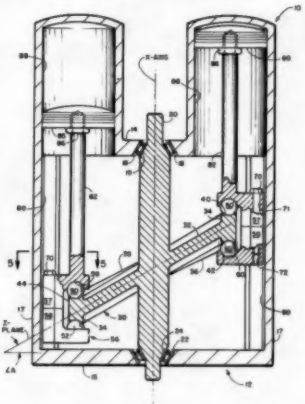
means for rotationally mounting said axle in said housing;

a rotative slant having a ring portion having a top surface and a bottom surface, said rotative slant being mounted on said axle so that they rotate as one, said rotative slant having a predetermined plane that passes through it intermediate the top and bottom surface of its ring portion, said predetermined plane intersects the longitudinal axis of said axle at a predetermined acute angle;

a first continuous groove formed in the top surface of the ring portion of said rotative slant and a second continuous groove formed in the bottom surface of the ring portion of said rotative slant;

at least one primary ball adapted to ride in said first continuous groove and at least one secondary ball adapted to ride in said second continuous groove;

at least one coupling slide for each pair of primary and secondary balls, said coupling slide having a first retaining means for capturing the top surface of said primary ball and maintaining it in said first continuous groove while permitting free rotation therein and second retaining means for capturing the bottom surface of said secondary ball and maintaining it in said second continuous groove while permitting free rotation therein;



track means within said housing oriented parallel to the axis of said axle, said coupling slide having track engaging means which allows it to slide along said track means; and

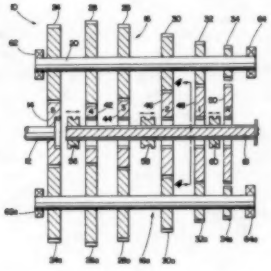
an extension rod aligned laterally offset from and parallel to the longitudinal axis of said axle, the bottom end of said extension rod being attached to the top of said coupling slide.

4,640,145

MULTIPLE COUNTERSHAFT TRANSMISSION

John R. Vandervoort, Richland, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1981, Ser. No. 289,007
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—325 **11 Claims**



1. An improved change gear transmission of the type comprising an input shaft having an input gear thereon, a mainshaft, at least two substantially identical countershafts equally circumferentially spaced about said mainshaft and driven by said input gear, said countershafts having an axis of rotation substantially parallel to the axis of rotation of said mainshaft, each of said countershafts having a plurality of countershaft gears supported thereon for rotation therewith, a plurality of

mainshaft gears surrounding said mainshaft and constantly meshed with one countershaft gear on each countershaft and clutch means for selectively clutching said mainshaft gears one at a time to said mainshaft, the improvement comprising:

said input gear and each of said mainshaft gears have a number of gear teeth defined by the relationship:

M is not equal to XN

wherein;

M=number of gear teeth on said input gear and said mainshaft gears,

X=a whole integer, and

N=the number of substantially identical countershafts.

4,640,146

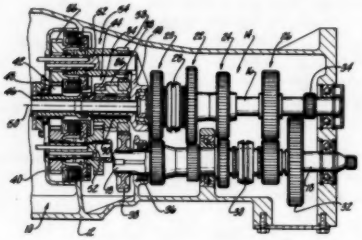
MULTIRATIO CONSTANT MESH CHANGE SPEED TRANSMISSION

John Buback, Pontiac, Mich., assignor to Massey-Ferguson Inc., Des Moines, Iowa

Filed Apr. 25, 1983, Ser. No. 488,495

Int. Cl.⁴ F16H *3/08*

U.S. Cl. 74—359 **6 Claims**



1. A multiratio constant mesh change speed transmission comprising:

a transmission housing;

an input gear rotatably mounted within the transmission housing for rotation about a central axis;

a plurality of support shafts nonrotatably carried by the transmission housing substantially equal radial distances away from said central axis;

a pair of gears rotatably journalled on each of said support shafts, each of said pair of gears including a first gear in constant mesh with said input gear, and a second gear;

a clutch pack assembly rotatably journalled on each of said support shafts, each assembly extending between the first and second gears and being capable when engaged of causing the first gear to be drivingly coupled to the second gear;

a further shaft mounted within the housing coaxial with the central axis;

a cluster of spaced apart output gears mounted on said further shaft for rotation with each other and each of said output gears being in constant mesh with one of said second gears; and

control means capable of selectively engaging one of said clutch pack assemblies at a time, whereby the output speed of the transmission can be varied.

4,640,147

GEAR ASSEMBLY ADAPTED FOR MATING WITH A THIRD GEAR WITHOUT BACKLASH

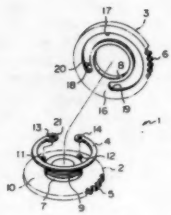
Masao Yasukawa, Okazaki, and Yukiyasu Taguchi, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 7, 1985, Ser. No. 742,294

Claims priority, application Japan, Jun. 12, 1984, 59-86061[U]

Int. Cl.⁴ F16H *55/18*

U.S. Cl. 74—409 **6 Claims**



1. A gear assembly adapted for mating with a third gear in a non-backlash manner, said assembly comprising:

first and second circular gears arranged so as to be coaxially and relatively rotatable, said gears having peripheral teeth with identical tooth profiles and having inner surfaces opposing each other;

first and second pin means standing on the inner surface of the first gear;

a spring having a generally arcuate shape with first and second ends and having first and second hole means adjacent to the respective ends thereof, said spring being carried by said first gear in a prestressed state by said first and second pin means engaged with said respective first and second hole means at each end of the spring,' at least said first hole means having a dimension, taken circumferentially of the assembly, greater than that of the associated first pin means so that said spring can be elastically deformed by application of a force to said spring at the first end thereof; and

a wall means on the inner surface of said second gear for defining a groove to cover said spring at least partly in the axial direction of the assembly, a part of said wall means abutting against said one end of said spring to cause elastic deformation to said spring, said first and second gears together being adapted to mate with the common third gear under the elastic deformation of said spring to provide non-backlash mating with said third gear.

4,640,148

STEERING MECHANISM OF RACK-AND-PINION TYPE

Akira Hasegawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 18, 1985, Ser. No. 756,276

Claims priority, application Japan, Jul. 19, 1984, 59-109445[U]

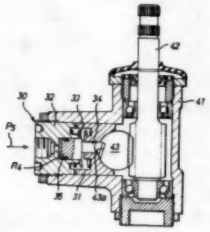
Int. Cl.⁴ B62D *3/12*

U.S. Cl. 74—422 **3 Claims**

1. A steering mechanism of the rack-and-pinion type comprising a gear housing integrally formed at one side thereof with a radial cylinder portion, a pinion shaft rotatably mounted within said gear housing and arranged to be operatively connected to a steering wheel, a rack member axially slidably carried on said gear housing across said pinion shaft and being in mesh with said pinion shaft to be moved in response to rotation of said pinion shaft, a guide member slidably disposed within the radial cylinder portion of said gear housing and having a thrust surface for slidable engagement with the rear surface of said rack member, a closure member threaded into the radial cylinder portion of said gear housing and fastened in

place, and a compression spring interposed between said guide member and said closure member to bias said guide member toward said rack member,

wherein said rack member is formed at the rear portion thereof with an axial cam groove, a cam follower element is slidably disposed within an axial bore of said guide member and engaged at one end thereof with the axial cam groove of said rack member to cause rotation of said



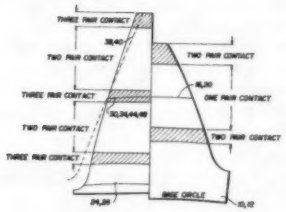
rack member in its circumferential direction, and a piston is slidably disposed within a counter bore in said closure member to form a pressure chamber for connection to a hydraulic pressure source and engaged at one end thereof with said cam follow element to effect movement of said cam follower element toward said rack member in accordance with a hydraulic pressure applied thereto in said pressure chamber.

4,640,149

HIGH PROFILE CONTACT RATIO, NON-INVOLUTE GEAR TOOTH FORM AND METHOD

Raymond Drago, Glenn Mills, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 4, 1983, Ser. No. 472,379
Int. Cl.[4] F16H *55/06*
U.S. Cl. 74—462 **5 Claims**



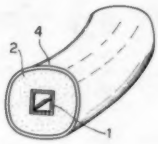
1. A gear set comprising a pair of mating gears having conjugate gear teeth, the profile of said gear teeth having substantially constant relative curvature (CRC) at all points of contact and a high profile contact ratio (HCR) of at least 2.

4,640,150

STEERING WHEEL WITH INTEGRALLY-SKINNED FOAMED THERMOPLASTIC RESIN-COVERED HANDWHEEL CORE HAVING FLOW MARK-OBSCURING ABRASION-RESISTANT COATING

Teruo Kobayashi, Inazawa, and Sadao Uchida, Ichinomiya, both of Japan, asrignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Dec. 14, 1984, Ser. No. 681,662
Claims priority, application Japan, Dec. 14, 1983, 58-235727
Int. Cl.[4] B62D *1/04*
U.S. Cl. 74—552 **5 Claims**



1. A steering wheel, comprising:

a core, including a rim portion;

a handwheel portion made of injection-molded foamed thermoplastic synthetic resin having an integral inner non-foamed, solid skin adhered to and enclosing said rim portion of said core, and having an integral outer non-foamed, solid skin;

said foamed thermoplastic synthetic resin of said handwheel portion, between said integral inner and outer solid skins thereof, possessing an expansion ratio in the range of 1.1–1.8 compared with said thermoplastic synthetic resin when nonfoamed; and

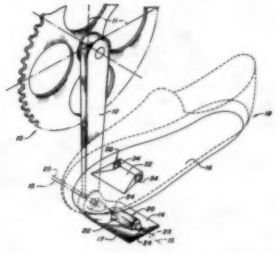
an abrasion-resistant coating adhered to and enclosing said outer skin of said handwheel portion, said coating being formed of a coating material containing a powdery lubricant in a coating material vehicle and being sufficiently thick as to substantially obscure from being seen or felt by hand any flow marks present on said outer solid skin.

4,640,151

BICYCLE PEDALLING APPARATUS

Richard J. Howell, 20 W. Canal St., #502, Winooski, Vt. 05404

Filed Feb. 27, 1984, Ser. No. 583,890
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 **15 Claims**



1. Pedalling apparatus for releasably and replaceably coupling a rider's foot to a pedal arranged to revolve about a pedal axis, said pedalling apparatus having the improvement comprising

A. latch means upwardly projecting on said pedal with first and second latch members selectively directed along a latch axis longitudinal with said pedal axis, said latch axis

and a transverse longitudinal axis being in a normally horizontal plane and said upward projection being normally vertical and orthogonal to that horizontal plane,

B. at least one of said latch members being resiliently biased relative to the other along said latch axis, and

C. socket means arranged for wearing on a rider's foot and having a walking surface free of pedal-engaging projections and having a latch-receiving recess with first and second latch seats for releasably and replaceably couplingly seating, against the action of said resilient bias, said latch members, said socket means being adapted to couple with said latch means upon vertical downward movement, upon longitudinal forward movement, and upon rotational twist movement of said socket means relative to said latch means,

D. whereby said socket means resists unseating of said latch means coupled therewith and transmits to said latch means a cycling thrust in response to pedalling loads, and said latch means unseats from said socket means in response to selected non-pedalling loads.

4,640,152

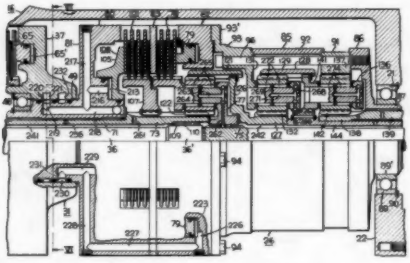
MULTI-SPEED PLANETARY TRANSMISSION

David C. Quick, New Berlin; Stephen J. McCormick, Shorewood, and Gerardus M. Ballendux, Waukesha, all of Wis., assignors to Deutz-Allis Corporation, Milwaukee, Wis.

Filed May 16, 1985, Ser. No. 734,545

Int. Cl.[4] F16H 57/02

U.S. Cl. 74—767 **19 Claims**



1. A single axis planetary change speed transmission comprising:

a stationary housing having wall means defining a hollow interior chamber including interior walls at opposite ends of said chamber defining a pair of axially spaced circular apertures disposed on said axis,

a rotatable housing having wall means defining an interior cavity and presenting hollow cylindrical end portions at its opposite ends and in constant rotation therewith,

a pair of bearing means rotatably mounting said end portions in said apertures, respectively, said end portions presenting openings, respectively, aligned on said axis,

an input shaft coaxial with and extending through said opening in one of said end portions of said rotatable housing,

first, second and third coaxial and axially spaced epicyclic gear sets operatively arranged in sequence within said cavity each including a ring gear component, a sun gear component and a planet carrier component rotatably supporting planet gears meshing with said ring and sun gear components,

a first quill shaft encompassing said input shaft and having a central portion extending through said opening in said one of said end portions and presenting an axially inner end connected for rotation with a first of said components of said first gear set,

means connecting said input shaft to a second of said components of said first gear set for rotation therewith and transmission of torque thereto,

means connecting a third of said components of said first gear set in torque transmitting relation with a first of said components of said second gear set,

means securing a second of said components of said second gear set to said rotatable housing for rotation therewith,

means connecting a third of said components of said second gear set to a first of said components of said third gear for transmission of torque thereto and rotation therewith,

means connecting a second of said components of said third gear set to said rotatable housing for rotation therewith,

a second quill shaft having one end connected for rotation with a third of said components of said third gear set, and a central portion extending coaxially through the opening in the other of said cylindrical end portions of said rotatable housing,

an output shaft coaxial with and extending through said second quill shaft having an axially inner end connected for torque transmitting rotation with said first component of said third gear set,

a first brake operatively associated with the axially outer end of said first quill shaft and said stationary housing and having engaged and disengaged conditions of adjustment in which said first component of said first gear set is, respectively, secured to and released from said stationary housing,

a second brake on said housing outside of said chamber operatively associated with said stationary housing and the other end of said second quill shaft and having engaged and disengaged positions of adjustment in which said second quill shaft is, respectively, secured to and released from said stationary housing,

a first clutch in said rotatable housing operatively associated with the latter and said first component of said first gear set and having engaged and disengaged positions of adjustment in which the latter is, respectively, connected for rotation with and disconnected from said rotatable housing,

a second clutch in said rotatable housing operatively associated with the latter and said second component of said first gear set and having engaged and disengaged conditions of adjustment in which said second component of said first gear set is, respectively, connected for rotation with and disconnected from said rotatable housing and

said output shaft providing

a reverse drive when said first brake and said first clutch are engaged and said second brake and said second clutch are disengaged,

a first forward drive when said second brake and said first clutch are engaged and said first brake and second clutch are disengaged,

a second forward drive when said brakes are engaged and said clutches are disengaged,

a third forward drive when said second brake and said second clutch are engaged and said first brake and said first clutch are disengaged,

a fourth forward drive when said first brake and said second clutch are engaged and said second brake and said first clutch are disengaged, and

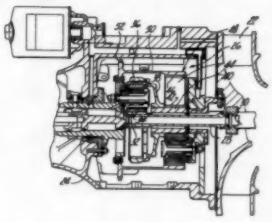
a fifth forward drive when said clutches are engaged and said brakes are disengaged.

4,640,153

ACCESSORY DRIVE FOR A TURBINE ENGINE

James W. Brogdon, Daphne; Kenneth D. Allen; John S. Barton, both of Mobile, all of Ala., and Raymond J. Hicks, Llandrindod Wells, United Kingdom, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 9, 1983, Ser. No. 559,646
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—789 6 Claims



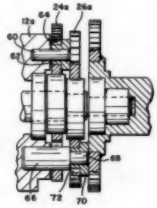
1. In combination:
a radial flow turbine engine having a main shaft and a casing with air inlets open radially at one end, and
an accessory drive comprising:
an accessory housing positioned axially adjacent said one end of the turbine engine casing,
a gear ring rotatably mounted within said accessory housing,
means for mechanically drivingly connecting said gear ring to said turbine main shaft, said connecting means comprising a planetary gear arrangement contained in said accessory housing,
said accessory housing having a plurality of apertures open to said gear ring and circumferentially spaced from each other,
at least one accessory having a driven gear, and
means for mounting said at least one accessory to said accessory housing so that said accessory registers with one of said plurality of apertures and so that said gear ring meshes with said driven gear,
wherein each aperture is adapted for connection with a separate accessory.

4,640,154

EPICYCLIC POWER TRANSMISSION

Merritt A. Osborn, 8706 Cedar Rd., Chesterland, Ohio 44026

Filed Sep. 9, 1983, Ser. No. 530,733
Int. Cl.[4] F16H *1/28*
U.S. Cl. 74—805 2 Claims



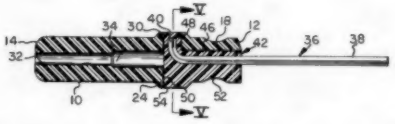
1. In an epicyclic power transmission system the improvement which comprises,
torque arm means,
an input shaft journalled for rotation;
a plurality of gear means including first and second gears axially spaced and eccentrically mounted on said input shaft with their throws essentially equally spaced, means interconnecting said gear means to said torque arm means including a first set of pin means connecting the torque arm means to one of said gears and a second set of larger pin means extending through said one of said gears and connecting said torque arm means to the other of said gears, said one of said gears having circular openings corresponding to said first and second sets of pins, said second set of larger pins each having first end portions secured to said torque arm and passing through said corresponding openings of said one of said gears and second end portions reduced in diameter from said first end portions, said second end portions of said second set of larger pins extending through said openings of said other gear and having bushing means mounted thereon and journalled in said openings in said other gear, said first set of pins having bushing means journalled in the corresponding openings in said one of said gears, said system preventing rotations of the eccentrically mounted gears about their own axis, while permitting gyration of their axis about a common axis, each pin in each set of pins being journalled in a bushing which bushing is mounted in a circular opening in its respective gear,
and means connecting an output means and said gear means to rotatively drive said output means.

4,640,155

HANDLE WITH ALTERNATE TOOL ORIENTATION

Harry F. Condon, 147 S. Howell St., Hillsdale, Mich. 49242

Filed Dec. 24, 1985, Ser. No. 813,090
Int. Cl.[4] B25B *23/00*
U.S. Cl. 81—439 8 Claims



1. A hand tool having a tool implement alternately positionable upon a handle comprising, in combination, an elongated handle having an outer surface, an axis, a front end and a rear end, an elongated axially extending radial slot defined in said handle laterally intersecting said handle outer surface and said handle front end, said slot including spaced, opposed flat parallel sides defined upon opposite sides of said handle axis and radially spaced relative thereto, an elongated implement having an axis, an outer end and an inner end, torque drive means defined on said implement outer end, a head integrally fixed on said implement inner end, said head including a pair of spaced parallel sides spaced apart a distance substantially equal to the spacing of said slot's sides whereby said head may be firmly received within said slot in a first position wherein said implement axis is substantially parallel to said handle axis and extends from said handle front end and a second position wherein said implement axis is transversely disposed to said handle axis, an elongated projection defined on said head extending in a direction transverse to said implement axis, a first recess defined in said handle and intersecting said slot having a length transversely disposed to said handle axis, a second recess defined in said handle and intersecting said slot having a length substantially parallel to said handle axis, said head projection being closely received within said first recess when said head is in said first position and closely received within said second recess when said head is in said second position, reception of said projection within a recess preventing withdrawal of said head from said slot in a direction parallel to said implement axis.

4,640,156
PRODUCTION OF SHORT METAL FIBERS

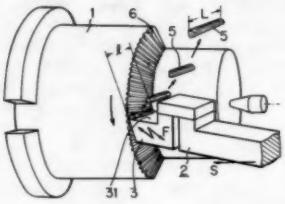
Takeo Nakagawa, Kawasaki, and Kiyoshi Suzuki, Misato, both of Japan, assignors to Research Development Corp., Tokyo and Aisin Seiki Kabushiki Kaisha, Aichi, both of, Japan

Continuation of Ser. No. 468,277, Feb. 22, 1983, abandoned, which is a continuation of Ser. No. 199,457, Oct. 22, 1980, abandoned. This application Oct. 15, 1984, Ser. No. 660,559

Claims priority, application Japan, Dec. 13, 1979, 54-161911; Sep. 8, 1980, 55-124362

Int. Cl.⁴ B23B *1/00, 37/00*

U.S. Cl. 82—1 C **5 Claims**



1. Process for producing short ultra-thin metal fibers having a cross-sectional dimension of less than 200 microns by directly cutting a metal block having a surface comprising the steps of:

(a) rotating said metal block such that said surface is moving at a cutting speed;

(b) contacting a cutting edge of an elastic tool to said surface at an entering cut, the cut having a width corresponding to a length of the fibers to be obtained, said elastic tool upon such contact self-generating self-excited vibrations;

(c) feeding said elastic tool towards said surface at a feed rate such that

(1) said cutting edge is dislocated in a feed force direction,

(2) the amplitude of said self-excited vibrations is larger that said feed rate,

(3) said cutting edge separates from said surface once per cycle of each self-excited vibration, and

(4) the cutting loci of the cutting edge contacting said surface are equal in n times and n+1 times of cutting,

to finely cut, break, and separate said fibers from said surface;

(d) and wherein the rake angle of the cutting edge is between 0° and a negative angle; and in accordance with the material nature and thickness of fibers to be produced, the cutting speed is determined between 20 and 200 m/min, the feed rate between 0.001 and 0.02 mm/rev, and the self-excited vibration between 1 and 7 KHz, thereby producing a needle-shaped fiber in each cycle of said self-excited vibrations having said cross-sectional dimension and having a length corresponding to said entering cut, each said fiber having a smooth, bright face, a rugged face, and a destroyed face.

4,640,157
PROCESS FOR LOADING A LATHE WITH BARS TO BE MACHINED AND LOADING DEVICE FOR CARRYING OUT OF THE PROCESS

Markus Geiser, Péry, and Claude Vandevoir, La Neuveville, both of Switzerland, assignors to Sameca S.A., Lamboing, Switzerland

Filed Jun. 1, 1984, Ser. No. 616,169

Claims priority, application European Pat. Off., Jun. 6, 1983, 83810243.2

Int. Cl.⁴ B23B *13/02*

U.S. Cl. 82—2.7 **15 Claims**

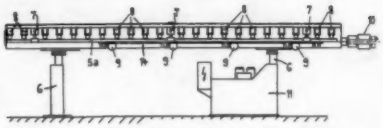
1. A method of loading a lathe having a gripping unit for gripping remnants of bar stock with new bar stock to be machined, said bar stock, during machining, being enclosed in a guiding tube having a stationary part and a mobile part, and being supported in said guiding tube and advanced toward the lathe by a supporting and advancing means, said guiding tube having a first end disposed adjacent said lathe and a second end remote from said lathe, said method comprising:

producing a first signal when said supporting and advancing means reaches a predetermined position adjacent the lathe such that only a remnant of bar stock is in the lathe;

determining if said gripping unit is firmly gripping said remnant;

withdrawing said supporting and advancing means toward of said guiding tube;

machining said remnant during said step of withdrawing when said first signal is being produced and said remnant is being firmly gripped by said gripping unit;



producing a second signal when said supporting and advancing means is withdrawn from said guiding tube to predetermined location;

opening the guiding tube by moving the mobile part thereof;

progressively and laterally introducing new bar stock to be machined into the stationary part of the guiding tube;

closing the guiding tube by returning the mobile part thereof;

producing a third signal indicative of completion of machining of the last piece of said remnant; and

advancing said supporting and advancing means towards said new bar stock in the presence of said third signal when said guiding tube is closed.

4,640,158
MULTIPLE-SPINDLE AUTOMATIC LATHE

Helmut F. Link, Aichwald; Günther Trautmann, Kirchheim-Nabern, and Albert Herrscher, Plochingen, all of Fed. Rep. of Germany, assignors to Index Werke Komm.-Ges. Hahn & Tessky, Esslingen, Fed. Rep. of Germany

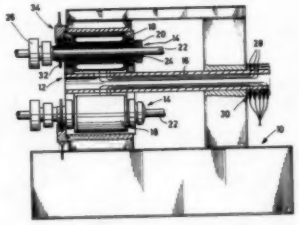
PCT No. PCT/EP84/00236, § 371 Date Apr. 3, 1985, § 102(e) Date Apr. 3, 1985, PCT Pub. No. WO85/00770, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 4, 1984, Ser. No. 721,115

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328496

Int. Cl.⁴ B23B *9/00*

U.S. Cl. 82—3 **12 Claims**



1. A multiple-spindle automatic lathe comprising a rotatable spindle drum; a plurality of work spindles rotatably mounted about the interior of said spindle drum; an individually controllable electric motor associated with each of said work spindles for rotatably driving the same; said motors being supportably

mounted in adjacent relationship in said spindle drum; stationary frame means for supportably mounting said spindle drum; means for indexing said spindle drum into a plurality of positions corresponding to the number of said work spindles; each of said work spindles comprising the shaft of its associated electric motor; said spindle drum having a supporting shaft end rotatably work spindles comprising the shaft of its associated electric motor; said spindle drum having a supporting shaft end rotatably mounted on said stationary frame means; current conducting slip rings mounted on said spindle drum shaft; current-conducting means interconnecting said slip rings and said motors; current-conducting brush means mounted on said stationary frame means for communication with an electrical supply for engaging said slip rings and energizing said motors by means of such electrical supply; control means for controlling the speed of each electric motor and the angular disposition of its associated shaft; said control means comprising angular position indicator means rotating synchronously with each of said spindles, and stationary signal-generating sensor means sensitive to the speed and angular disposition of said angular position indicator means.

4,640,159

TOOL HOLDER WITH PLURALITY OF CUTTING INSERTS

Stojan Stojanovski, 1950 Birchwood, Troy, Mich. 48084

Filed Nov. 22, 1985, Ser. No. 800,798
Int. Cl.⁴ B23B *29/30*
U.S. Cl. 82—36 A **7 Claims**

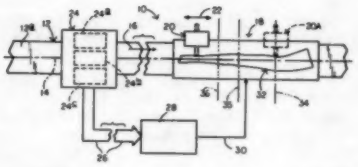
1. A combination comprising:
an elongated body having a longitudinal opening;
a shank disposed in the longitudinal opening of the body for rotatable and longitudinal motion, the shank having a first end adjacent one end of the body and a second end adjacent the opposite end of the body;
handle means carried on the first end of the shank for rotating same between a first rotated position and a second rotated position, and for moving same between longitudinally spaced positions along a generally linear path of motion, including a locking position and a release position;
tool holder means including a head carried on the second end of the shank so as to be movable therewith between said locking position and said release position;
a first cutting insert and a second cutting insert mounted on the head such that the first insert is disposed in a cutting position in said first rotated position, and the second insert is disposed in said cutting position when the first insert is disposed in said second rotated position;
interengagable pin and socket means carried on the head and the body, including a socket and a pin member received in the socket as the handle means is moved to said locking position, to block the head against rotation with respect to the body, the pin being removable from the socket as the handle means is moved to said release position, to permit rotation of the head with respect to the body; and
bias means carried between the shank and the body to bias the shank towards said locking position with respect to the body, whereby the user can exchange the first insert with the second insert by pushing the handle in a linear motion to release the head, rotating the head and the releasing the handle as the pin is received in said socket.

4,640,160

SWEEP-DATA-RESPONSIVE, HIGH-SPEED, CONTINUOUS-LOG-TRAVEL BUCKING APPARATUS

John E. Hards, Delta, Canada, assignor to Brunette Machine Works, Ltd., New Westminster, Canada

Filed Dec. 9, 1985, Ser. No. 806,502
Int. Cl.⁴ B27B *7/00*
U.S. Cl. 83—71 **2 Claims**



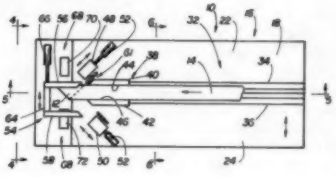
1. High-throughput, high-end-product-recovery log-bucking apparatus featuring continuous log travel comprising
transport means defining an endo log-transport path for the continuous movement of a log endo along the path,
flying-saw log-bucking mechanism disposed along said path for bucking a log, while the same travels continuously along the path, at one or more selected locations along the length of the log,
log-configuration-determining means located adjacent said path, upstream from said log-bucking mechanism, including means for generating data related to a log's sweep as the log travels toward said log-bucking mechanism, and
control/decision means operatively connected both to said log-bucking means and to said log-configuration-determining means, responsive to log-sweep data generated by the latter, relative to a traveling log, to control bucking of the log by the former in a manner facilitating, ultimately, the optimum recovery of usable wood end-product from the log.

4,640,161

WOOD CUTTING APPARATUS

Robert L. Kurk, 3524 Hanover Rd., Jeffersontown, Ky. 40299

Filed May 31, 1985, Ser. No. 739,521
Int. Cl.⁴ B27B *5/00*
U.S. Cl. 83—104 **19 Claims**



1. A saw apparatus for cutting a workpiece from a stock of material comprising:
stock material guide means for guiding the movement of the stock material along a predetermined path;
a pair of saws located to opposite lateral sides of the path determined by the stock material guide means, each of the saws being adapted for movement across the guide means to cut a workpiece off of the stock material located on the guide means;
a movable workpiece holder located at the end of the guide means defining the downstream end of the predetermined path movable back and forth in a direction transverse to the predetermined path of the guide means across the downstream end of the predetermined path, adapted to alternately engage opposite sides of and support the por-

tion of the stock material comprising the workpiece being cut-off the stock material; and

means for ejecting the severed workpiece from the workpiece holder after the workpiece has been cut-off the stock material as the workpiece holder moves the workpiece transversely away from the lateral sides of the guide means.

4,640,162

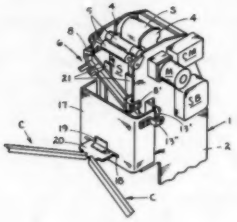
APPARATUS FOR FORMING AND PRESENTING BIAS CUT GUSSETS IN THE FORMATION OF PANTY HOSE GARMENTS

J. Reid London, Winston-Salem; Cecil R. Bell, Jr., Pinnacle; A. Russell Edwards, Winston-Salem; Willie M. Lathery, Germanton; Lee A. Efird, Kernersville, all of N.C.; Richard M. Porter, Hartsville, S.C.; Stephen K. Shaw, Winston-Salem, N.C.; Thomas J. Costello, Kernersville, N.C.; August A. Pike, Winston-Salem, N.C.; Donald G. Bell, Mocksville, N.C., and Harold Setliff, High Point, N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Mar. 10, 1986, Ser. No. 838,314

Int. Cl.[4] B26D *7/06;* **B21D** *43/00*

U.S. Cl. 83—152 **11 Claims**



1. An apparatus for forming inserts such as gussets or the like of predetermined configuration to be sewn to hosiery blanks to define panty hose or other type lower body garments comprising:

a frame structure positioned adjacent to and oriented with a machine having a pair of clamps adapted to hold the hosiery blanks as well as the gussets;

a support for holding a supply of material from which the gussets are formed;

a feeding assembly positioned downstream of said support for intermittently feeding said material;

a cutting device having fixed and moveable blades between which blades said material is intermittently fed, the cutting edges of said blades being positioned at a predetermined angle for cutting said material into such predetermined angle for cutting said material into such predetermined configuration; and

a transfer and orienting mechanism downstream of said cutting device for orienting and placing the cut gussets in a location adjacent the path of said clamps, reciprocable pusher means positioned adjacent to and on the side of the formed and oriented gusset remote from said clamps, and means to move said pusher means into engagement with said gusset and push same into said clamps for subsequent uniting with said hosiery blanks or the like.

4,640,163

UMBILICAL SAFETY JOINT

Larry D. Douglas, Cypress, Tex., assignor to Multiflex International, Inc., Magnolia, Tex.

Filed Aug. 26, 1985, Ser. No. 769,130

Int. Cl.[4] B26D *7/14*

U.S. Cl. 83—175 **14 Claims**

1. A safety joint apparatus for cutting the flexible control hoses of a hose bundle which comprises:

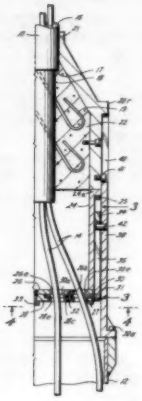
a fixed plate having a hole for each control hose to pass therethrough;

a cutter plate movable relative to said fixed plate;

said cutter plate having a hole corresponding to each hole in said fixed plate for each control hose to also pass therethrough;

first tubular support means for said fixed plate;

second tubular support means for said cutter plate slidably concentric with said first tubular support; and



actuating means operably interconnecting said first tubular support means and said second tubular support means to cause said cutter plate to move relative to said fixed plate upon separation of said first tubular support means and said second tubular support means relative to each other upon a predetermined tension being applied to the hose bundle for cutting the control hoses.

4,640,164

HIGH SPEED WIRE CUTTER

Ivan K. Pavlov, Palatine, Ill., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed May 2, 1985, Ser. No. 729,599

Int. Cl.[4] B23D *25/12*

U.S. Cl. 83—304 **5 Claims**

1. A machine for cutting a moving wire passing therethrough, comprising:

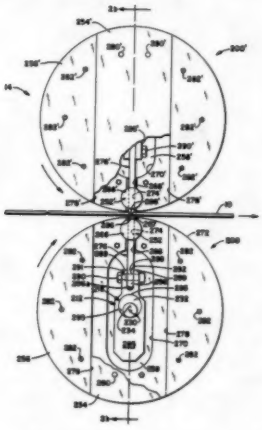
(a) a pair of knife carriers, each of said carriers including a knife blade having a cutting edge, each of said knife carriers having a bore therethrough;

(b) a pair of parallel shaft means, each of said shaft means including a carrier shaft and a coaxial drive shaft having an axis of rotation, each of said carrier shafts including an eccentric having a center offset from said shaft axis, one of said carrier shafts extending through said bore in each of said knife carriers, wherein each of said eccentrics mates for rotation with the bore in its respective knife carrier;

(c) means for connecting each knife carrier to its respective drive shaft for rotation therewith, said connecting means comprising a pair of knife wheels, each of said wheels having a cut-out therein for receiving one of said knife carriers and including means for trapping in and limiting axial movement of its respective knife carrier, said connecting means further comprising blade guide means attached to each of said knife wheels; said guide means rotatable about an axis parallel to its respective drive shaft axis, each of said blade guide means having a slot therethrough and one of said knife blades extending through each of said slots, said knife blades being slidable therewithin;

(d) means for rotating said drive shafts; and

(e) means associated with each of said shaft means for coupling said carrier shaft to its respective drive shaft such that each coupled carrier shaft and drive shaft rotate together about their respective drive shaft axis, and for uncoupling said carrier shaft from its respective drive shaft and stopping the rotation of said uncoupled carrier shafts such that each knife carrier and its respective cutting edge rotates about the center of the eccentric on



which it is disposed, wherein each cutting edge moves in reciprocal fashion in a substantially radial direction relative to said shaft axis, said means for stopping rotation including means for stopping rotation of said carrier shafts in a position wherein said cutting edges meet substantially on a line intersecting and perpendicular to both of said drive shaft axis when said cutting edges are at their maximum radial extent, and cooperate to cut the moving wire as said knife carriers rotate.

4,640,165

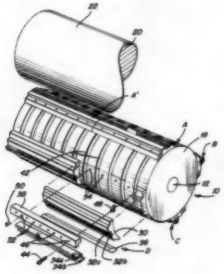
ROTARY KNIFE SYSTEM

Raymond D. McMahon, Naperville; John C. Jellovitz, Lake Barrington; James T. Vaile, Brookfield; Gregory J. Renn, Naperville, and Elmer J. Ondeck, Riverside, all of Ill., assignors to Baldwin Technology Corporation, Stamford, Conn.

Filed Apr. 11, 1985, Ser. No. 722,729

Int. Cl.[4] B26D *1/42*

U.S. Cl. 83—346 **14 Claims**



1. A rotary-type papercutting apparatus comprising:

(a) a knife roller;

(b) a cooperating anvil roller having an anvil on its periphery against which the paper is cut, said knife roller and said anvil roller being rotatable about parallel longitudinal axes in timed relationship to the travel of the paper therebetween;

(c) at least one knife carrying unit mounted on the periphery of said knife roller, said knife carrying unit movable around the circumference of said knife roller, said knife carrying unit comprising:

(i) a knife holder formed of a resilient elastomeric material having a Shore D hardness of about 70–80 and having at least one slot extending longitudinally on the radially outwardly presented face of said knife holder;

(ii) a cutting knife carried within said slot of said knife holder and having at least one radially outwardly presented cutting edge for engagement with said anvil to cut the paper repeatedly;

(d) means for retaining said knife holder on the periphery of said knife roller comprising at least one retaining member and fastening means passing through said retaining member and into receptacles within said knife roller;

said knife holder formed of resilient elastomeric material yielding within its elastic limits during the cutting operation to take up displacement of said cutting knife by said anvil roller and to allow said cutting knife to settle into its cutting position within said knife holder.

4,640,166

TURRET PUNCH PRESS

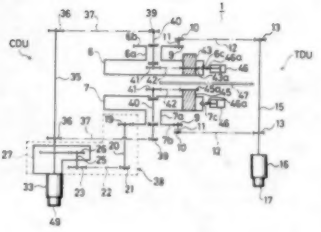
Masayoshi Mizukado, Kani; Akio Morishita, Inuyama, and Yoshihiro Muto, Mino, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Aichi, Japan

Filed Oct. 28, 1985, Ser. No. 792,022

Claims priority, application Japan, Oct. 29, 1984, 59-227517

Int. Cl.[4] B21D *28/36*; B26D *5/06*

U.S. Cl. 83—552 **3 Claims**



1. A turret punch press including a rotatably mounted upper turret and a rotatably mounted lower turret, said upper turret and said lower turret being provided with at least one upper tool and a at least one lower tool, respectively, said upper and lower tools being positioned in a predetermined striking position by rotating said turrets, said upper and lower tools being rotatably mounted and positioned within the respective turrets for performing a punching process while holding the tools in desired angular positions, comprising:

a first drive means for driving said upper turret and said lower turret in such a manner that said upper and lower turrets can be synchronously rotated through a turret drive system; and

a second drive means for driving said upper tool and said lower tool in such a manner as that said upper and lower tools can be synchronously rotated within their respective turrets through a tool drive system;

said tool drive system being connected to said turret drive system through a differential gear mechanism, gear ratios of both the drive means and the differential gear mechanism being set as such that said tools can be driven by said first drive means within the respective rotatable turrets

without changing angular position thereof while said second drive means is stopped.

4,640,167

TAPE DISPENSER

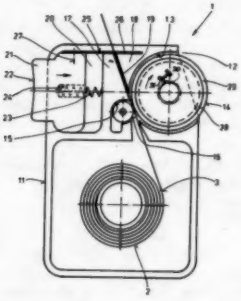
Hans Stusack, and Peter Schulz, both of Tettnang, Fed. Rep. of Germany, assignors to Franz Sachs & Co. KG, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,539

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420873

Int. Cl.[4] B26D *5/10*

U.S. Cl. 83—649 **10 Claims**



1. A device for dispensing elongated material which is stored on a supply reel, comprising a housing having outer walls and defining an inerior supply reel space for rotatably receiving a supply reel of elongated material, guide means in said housing defining a guide path from said supply reel space through one of said outer walls for elongated material to leave said housing, a manually rotatable drive wheel rotatably mounted at one end of said one outer wall and in said housing, said drive wheel having an outer periphery, a part of said outer periphery of said drive wheel being accessible from outside said outer walls of said housing and said outer periphery tangentially intersecting said guide path for engaging elongated material so that rotation of said drive wheel in one direction moves elongated material along said guide path from said supply reel space out of said housing, a cutting knife movably mounted in said housing in a direction across said guide path and parallel to said one outer wall and adjacent said one outer wall of said housing for cutting elongated material supplied from said supply reel space along said guide path by said drive wheel, said housing including a displacement slot extending parallel to said one outer wall of said housing which is adjacent to said cutting knife, said cutting knife being displaceable able in said slot, said slot extending across said guide path, a pushbutton movably mounted in said housing in a direction parallel to said one outer wall and toward said drive wheel, said pushbutton being fixed to said cutting knife and having a portion accessible from outside said housing on an opposite side of said one outer wall from said drive wheel, and a spring engaged between said pushbutton and said housing for biasing said pushbutton in a direction out of said housing, and away from said drive wheel for moving said knife in a direction away from said guide path.

4,640,168

APPARATUS FOR CUTTING CIGARETTES

Yutaka Okumoto, Musashino, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

Filed Jan. 17, 1986, Ser. No. 819,608

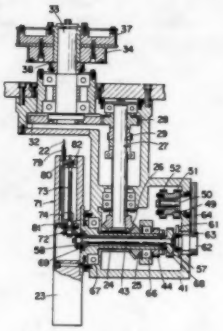
Claims priority, application Japan, Mar. 27, 1985, 60-060980

Int. Cl.[4] A24C *5/28*

U.S. Cl. 83—677 **4 Claims**

1. In an apparatus for cutting cigarettes in a cigarette making machine, including a cutter head supported rotatably on a first rotary shaft, a knife projecting from said cutter head, and means provided in said cutter head for holding and advancing said knife, the improvement which comprises:

a second rotary shaft which is coaxial with said first rotary shaft;



a gear train provided between said first and second rotary shafts for rotating said second rotary shaft at a speed which is slightly different from that of said first rotary shaft; and

said knife advancing means including a feed screw member adapted for rotation by said second rotary shaft.

4,640,169

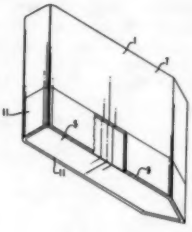
CEMENTED CARBIDE CUTTING TOOLS AND PROCESSES FOR MAKING AND USING

Robert E. Fromson, Wilkins Township, Allegheny County; Ram Kossowsky, Pittsburgh, both of Pa., and Charles S. Nunnamaker, Amherst, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 342,525, Jan. 25, 1982, abandoned. This application Mar. 28, 1985, Ser. No. 717,480

Int. Cl.[4] B26F *1/14*; B21D *28/34*

U.S. Cl. 83—685 **10 Claims**



1. A resharpenable cemented carbide cutting tool, said cutting tool having a cemented carbide cutting edge hardened by ion implantation and being resharpenable for reuse without further ion implantation, said cutting tool comprising:

a first surface;

a second surface joining said first surface;

a cemented carbide cutting edge formed at the junction of said first and said second surfaces;

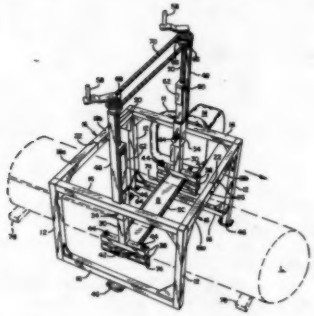
a wear-resistant layer located along said first surface and extending away from said cutting edge and said second surface beneath and parallel to said first surface to a depth of up to approximately 1000 angstroms, and intersects said second surface in a zone up to approximately 1000 angstroms wide; the hardening of the cutting edge by ion

implantation along only said first surface and not along said second surface enabling resharpening of the cutting tool by removing material from said second surface, said second surface being hardened only in a zone up to approximately 1000 angstroms wide at the intersection of said first surface and said second surface.

4,640,170
CHAIN SAW CARRIAGE

John A. Bakken, 8837 S. Barnards Rd., Canby, Oreg. 97013

Filed Feb. 28, 1985, Ser. No. 706,526
Int. Cl.[4] B27B *17/00*
U.S. Cl. 83—794 **4 Claims**



1. A portable chain saw attachment for a chain saw to facilitate cutting a reclined log into lumber, the log being supported by a substantially planar log supporting surface, the chain saw having a saw chain, saw bar, motor end and opposite nose bar end, the attachment comprising:

frame means having interconnected frame members for straddling the log without contacting the log;

a plurality of sliding members mounted to said frame for direct contact with said supporting surface such that said frame can slide on said supporting surface relative to said log, said sliding members having substantially planar bottom portions;

mounting means for mounting the chain saw such that said saw chain defines an imaginary cutting plane disposed at a predetermined relationship to said log supporting surface;

height adjusting means interconnecting said frame means and mounting means for adjusting the height of said mounting means relative to said log supporting surface;

said frame means including a plurality of substantially vertical support members and horizontal support means supportively interconnecting said vertical members;

said horizontal support means including opposed pairs of telescoping support members adjustable to vary the width of said frame means and thereby accommodate saw bars of different lengths;

said mounting means including first clamping means for clamping said nose bar end and second clamping means for clamping said motor end;

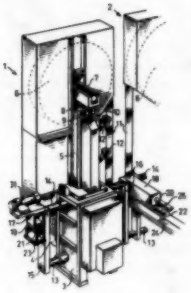
said height adjusting means including a pair of rotatable threaded elements, one associated with each said first and second clamping means, and a pair of vertically movable support elements, one connected to each said first and second clamping means, each said movable support element being threadably engaged by one said threaded element such that rotation of said threaded element causes its associated said support element and clamping means to move upwardly or downwardly; and

said height adjusting means further including a drive chain cooperable with said threaded support elements for translating rotation of one said threaded element into simultaneous corresponding rotation of the other said threaded element.

4,640,171
BAND SAW INSTALLATION WITH VERTICALLY SPACED GUIDES

Kurt Jansson, Mariannelund, Sweden, assignor to AB A.K. Eriksson, Mariannelund, Sweden

Filed Aug. 20, 1985, Ser. No. 767,447
Claims priority, application Sweden, Aug. 23, 1984, 8404210
Int. Cl.[4] B27B *15/08*
U.S. Cl. 83—797 **5 Claims**



1. A band saw installation, especially intended for sawing logs with the grain or dividing wood blocks, comprising: two spaced pairs of upper and lower saw band pulleys (6, 4) which can be adjusted relative to one another, a pair of endless, band-like saw blades (11) individually extending around each pair of pulleys and individually driven by one (4) of the pulleys in each pair, a pair of frame structures (3) in which the lower pulleys of each pair are individually journalled, and two pairs of mutually parallel guide members (13, 14) extending at right angles to the feed direction of the material to be sawn, said frame structures being individually and slidably mounted on said pairs of guide members, each frame structure carrying a vertically upstanding post (5) which in turn carries at a top thereof said upper pulley (6), and one guide member (14) of each pair being located substantially vertically above the other guide member (13) of each pair, said installation thus being substantially vertical in overall configuration and horizontally compact in the feed direction of the material, and the weight of the installation being substantially equally distributed between and borne by the upper and lower guide members of each pair.

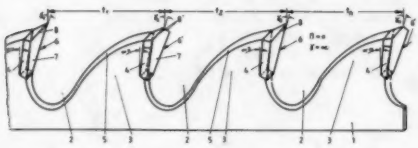
4,640,172
SAW BLADE

Rolf Kullmann, and Jörg Kullmann, both of Spangenberg, Fed. Rep. of Germany, assignors to Wilhelm H. Kullmann Wikus-Sägenfabrik, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,830
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307170
Int. Cl.[4] B23D *61/00, 61/04, 61/14*
U.S. Cl. 83—835 **9 Claims**

1. A saw blade comprising a foundation of spring steel, said foundation including an edge portion with a series of teeth formed therein at intervals therealong for cutting in the plane of the blade foundation, each of said teeth separated from its adjacent teeth by chip spaces with a seat formed on one edge of each tooth for supporting a cutting material plate and a tooth back formed on its other edge, said seats being formed at rake angles (α) varying from tooth-to-tooth, a cutting material plate mounted to the seat of each tooth, each of said cutting material plates including a cutting edge oriented generally transverse to the plane of the blade foundation and at a location

to effect a cutting action in the plane of the blade foundation and a front surface formed at substantially equal rake angles (β), with each cutting material plate mounted to the seat of a tooth to orient each tooth front surface at an effective rake angle (γ) different from the effective rake angle (γ) of the front



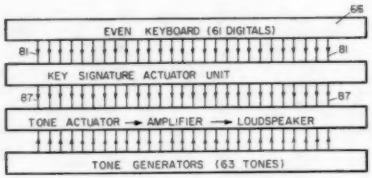
surfaces of others of said cutting material plates, and said teeth being variably spaced along the edge portion of said foundation so that the pitch distance (t) between the cutting edges of some adjacent ones of said cutting material plates is different in comparison to the pitch distance (t) of other adjacent ones of said cutting material plates.

4,640,173

ELECTRONIC MUSICAL INSTRUMENT

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806

Filed May 22, 1985, Ser. No. 736,701
Int. Cl.[4] G10H *1/00*; G10C *3/12*
U.S. Cl. 84—1.01 **9 Claims**



1. An improved musical instrument having a keyboard containing a plurality of fifteen front digitals and a plurality of fifteen back digitals, the front digitals being arranged in a sequence, a single one of the back digitals being positioned between each two consecutive members of the sequence of front digitals, the instrument having tone actuator means for actuating a plurality of twenty-four musical tones, the tones being arranged in a sequence having a musical interval of a single semitone between each two consecutive members of the sequence of tones, the improvement comprising:

electronic key signature actuator circuitry for the digitals to actuate the tone actuator means, there being exactly seven consecutive front digitals per octave span, the circuitry comprising twenty-four electronic tone substitution modules arranged in sequence so that each substitution module activates its single associated member of the sequence of musical tones,

each substitution module having left, central, and right input leads receiving signals from their respective members of the two pluralities of digitals, the single digital transmitting a signal to the central input lead of a substitution module being designated its central digital, the substitution module being controlled by left and right enabling leads,

when neither enabling lead is energized, the single musical tone associated with the module being played by its central digital,

when the left enabling lead is energized the musical tone associated with the module being played by a digital to the left of its central digital,

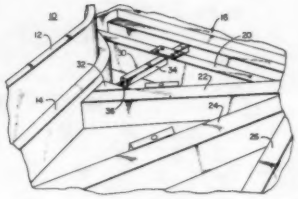
when the right enabling lead is energized the musical tone associated with the module being played by a digital to the right of its central digital.

4,640,174

SOUNDBOARD CALIBRATOR

Santi Falcone, Carlisle, Mass., assignor to Falcone Piano Company, Haverhill, Mass.

Filed Jan. 16, 1985, Ser. No. 691,940
Int. Cl.[4] G10C *3/08*
U.S. Cl. 84—196 **7 Claims**



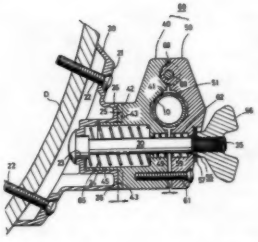
1. A piano tension adjusting system comprising a rim, a belly rail, a soundboard, and a tension adjusting device, said tension adjusting device being interconnected between said rim and said belly rail to adjust the tension on the soundboard and including a beam memeber and adjustment means for selectively increasing the length of the tension adjusting device to increase the tension applied to the soundboard and decreasing the length of the tension adjusting device to decrease the tension applied to the soundboard.

4,640,175

SUPPORT LEG FOR BASS DRUM

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Jan. 13, 1986, Ser. No. 818,550
Claims priority, application Japan, Feb. 6, 1985, 60-015438
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—421 **6 Claims**



1. A support leg for a bass drum having a supporting bass drum body, the support leg comprising:

an elongated leg member;

a base member having an attachment means for attaching the base member to the drum body; and

a circular surface on the base member having a first positioning member thereon;

a shaft means projecting from the center of the circular surface, one end of which is attached to the base member,

a leg holding member comprising:

inner and outer block members surrounding the shaft having mutually facing surfaces for holding the leg member, the inner block having a mating circular surface which slidably mates with the circular surface of

the base member and a second positioning member which mates with and engages the first positioning member;

means, mounted to the other end of the shaft, for releasably engaging the outer block and urging the blocks together;

a first spring means between the blocks surrounding the shaft and having a spring pressure for urging the blocks apart;

a member connecting the blocks for setting and holding predetermined gap between the blocks;

a second spring means between the inner block and base member surrounding the shaft and having a spring pressure for urging the inner block and base apart, the second spring means having a spring pressure which is smaller than the spring pressure of the first spring means;

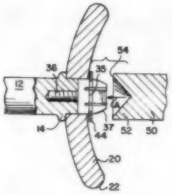
wherein when the outer block is released, the gap between the inner and outer blocks widens to the predetermined gap by the coaction of the first spring means between the inner and outer blocks loosening the leg member therebetween, and a gap between the base and inner block is subsequently created by the coaction of the second spring means between the inner block and base to permit rotation of the leg holding member on the base and disengagement of the first and second positioning members.

4,640,176

QUICK DISCONNECT RETAINER FOR A DETACHABLE DRUMSTICK HEAD

Francis J. J. Elliott, Jr., Band, OPS Co., H&S BN, MCDEC, Quantico, Va. 22134

Filed Oct. 18, 1984, Ser. No. 662,345
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **17 Claims**



1. A connector for a drumstick having a removable head comprising:

a main body element;

attachment means at one end of said main body element to permit semi-permanent attachment thereof to an elongated drumstick;

connector means at the other end of said main body element for quickly attaching and detaching a drumstick head thereto;

retainer means operable in conjunction with said connector means for securing said head in place upon a drumstick;

said attachment means at one end of said main body element comprising a central projection extending therefrom for complementary engagement with an aperture in the end of said drumstick;

said centrally extending projection being externally threaded;

said drumstick having internal threads provided within said aperture for complementary engagement with the external threads of said projection;

said connector means at the other end of said main body element comprising spring means which are movable radially for engagement with said retainer means in releasable fashion; and

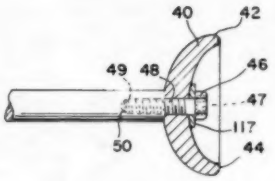
said spring means comprising a plurality of resilient fingers extending from the other end of said main body element.

4,640,177

DRUMSTICKS OR MALLETS WITH PARA-HEMISPHEROIDAL HEADS AND THEIR ASSEMBLY

Francis J. J. Elliott, Jr., Band, OPS Co., H&S BN, MCDEC, Quantico, Va. 22134

Filed Oct. 26, 1984, Ser. No. 665,139
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **12 Claims**



1. A drumstick or mallet comprising:

an elongated handle;

at least one enlarged, para-hemispheroidal head means attachable to said handle for use in beating a percussion instrument; and

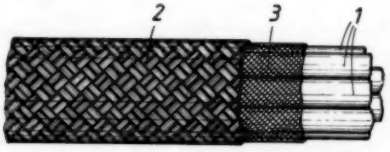
means for detachably affixing in secure fashion said head means to said handle.

4,640,178

ROPE

Erich Kurzböck, Wels, Austria, assignor to Teufelberger Gesellschaft m.b.H., Austria

Filed Jan. 25, 1985, Ser. No. 695,080
Claims priority, application Austria, Feb. 1, 1984, 317/84
Int. Cl.[4] D04C *1/12*
U.S. Cl. 87—6 **8 Claims**



1. A rope which comprises:

a plurality of elongate textile elements consisting of twisted textile fibers;

an array of reinforcing monofilaments extending throughout the length of the rope and having a higher hardness than said textile elements and an elongation to break which is not in excess of that of said textile elements, surrounding each of said textile elements; and

a sheath of braided monofilament surrounding said plurality of elongate textile elements, the total cross sectional area of said reinforcing elements amounting to less than 10% of the total cross sectional area of said rope.

4,640,179

COMPOSITE METALLIC CORE LINE

Robert W. Cameron, 7725 115th Pl. NE., Kirkland, Wash. 98003

Continuation-in-part of Ser. No. 624,222, Jun. 25, 1984, abandoned. This application Sep. 20, 1985, Ser. No. 778,365
Int. Cl.[4] D04C *1/12*; D07B *1/16*
U.S. Cl. 87—6 **12 Claims**

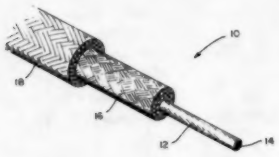
1. A composite line structure, comprising:

a core of a heat-resistant, substantially inelastic, metallic

cable, having a tensile strength sufficient to separately support the desired rated load;

an inner nylon sheath braided or wrapped tightly about said core; and

an outer polyester sheath braided or wrapped tightly about said inner sheath and shielding said inner sheath from exposure to sunlight or abrasion, said inner and outer sheaths having a combined tensile strength substantially exceeding the tensile strength of said core and containing



said core therewithin upon breakage of said core under extreme loading to substantially eliminate backlash, said core having a weight sufficient to minimize backlash of said inner and outer sheaths upon subsequent breakage thereof, whereby a substantially static line is provided which will support the rated load even if said inner and outer sheaths are melted or severed by fire, heat or sharp objects, which substantially eliminates backlash, and which protects the nylon inner sheath from abrasion and sunlight.

4,640,180

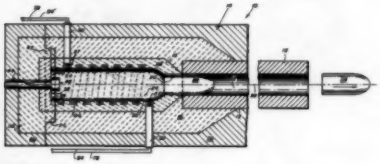
GUN-FIRING SYSTEM

Millard F. Rose, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1985, Ser. No. 746,824

Int. Cl.[4] F41F *1/00*; F42B *5/00*

U.S. Cl. 89—8 **15 Claims**



1. A gun firing system comprising:

a barrel having a longitudinally extending bore between its ends,

breech means connected to the inner end of the barrel, the breech means having a chamber for receiving propellant for accelerating and launching a projectile in the barrel bore at the inner end, the chamber being closed off from open communication with the bore when the projectile is in the bore at the inner end of the barrel,

removable cap means connected to the outer end of the breech means for closing off the outer end of the chamber, said cap, means including detonator means for igniting propellant in the chamber,

said breech means being comprised of inner and outer sleeve means, the inner sleeve means being made up of insulated and electric nonconducting material that surrounds the chamber and extends between its ends, the outer sleeve means being of electrically nonconductive material, the inner sleeve means including electromagnetic coil means embedded therein such that the coil means extends between the ends of the inner sleeve means while at the same time the coil means is concentrically and helically wound about the axis of the sleeve means,

a pair of pressure responsive switch means, first switch means of the pair being connected to the inner and outer sleeve means at the barrel end thereof and being arranged in direct open communication with the chamber at its inner end, second switch means of the pair being connected to the inner and outer sleeve means at the cap means end thereof, said second switch means being arranged in direct open communication with the chamber at its outer end and longitudinally spaced from the first switch means, said pair of switch means being responsive to a plasma pressure formed in the chamber upon detonation of the propellant so as to actuate both switch means of the pair when the pressure of the plasma formed in the chamber substantially extends throughout the chamber, and

power supply means operatively associated with and electrically connected to said detonator means, said power supply means being operable for actuating said detonator means to ignite the propellant so as to progressively form a plasma between the ends of the chamber; and the power supply means, in response to the plasma pressure actuating the first and second switch means, being further operable for energizing the coil means to induce eddy currents in the plasma so as to increase the temperature and pressure thereof thereby increasing the velocity of the projectile as it exits from the outer end of the barrel during system use.

4,640,181

AUTOMATIC GUN LOADING DEVICE FOR A TANK

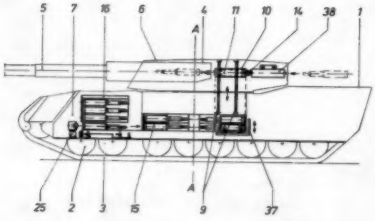
August Schiele, and Wolfgang Huber, both of Augsburg, Fed. Rep. of Germany, assignors to Kuka Wehrtechnik GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 285,037

Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3025501

Int. Cl.[4] F41F *9/10*

U.S. Cl. 89—46 **6 Claims**



1. A device for automatically loading large-caliber ammunition into a gun mounted on a rotatable turret of a tank, the gun having a bore for receiving a cartridge and a zero elevation position with respect to the turret, the turret rotatably mounted to the tank about an axis of rotation, and the tank movable in a forward direction having a longitudinal axis parallel to the forward direction, and a driver seat at one side of the longitudinal axis in front of the turret in the forward direction, the device comprising:

a first magazine rotatably mounted to the tank below the turret and about the axis of rotation of the turret, said first magazine having at least two substantially horizontal levels for at least two vertically spaced cartridges to be held one over the other, and a plurality of radially extending magazine compartments at each level for carrying a plurality of cartridges at each level pointing toward the axis of rotation, said first magazine being independently rotatable with respect to the turret;

an elevator mounted in the turret at a position to lift a cartridge from one of said radial compartments to a cartridge

station in alignment with the gun bore when the gun is in its zero elevation position, said elevator mounted for movement parallel to the axis of rotation;

means defining a vehicular trough in the tank, in front of the turret in the forward direction and next to the driver's seat;

a second magazine disposed in said trough and having a plurality of chutes disposed, one next to the other, transversely of the forward direction, each chute extending parallel to the longitudinal axis of the tank and having a space for a single vertical stack of at least three cartridges facing rearwardly of the forward direction, a lowermost position for a cartridge in each chute being above a lowermost one of said levels of said first magazine;

a cartridge pickup movably mounted to the tank below said second magazine for movement of a cartridge from a lowermost position in each chute to a position parallel to the longitudinal axis and adjacent one magazine compartment at said lowermost level of said first magazine;

first drive means connected to said cartridge pickup for moving said cartridge pickup laterally of the longitudinal axis from said lowermost position of each chute to said position parallel to the longitudinal axis; and

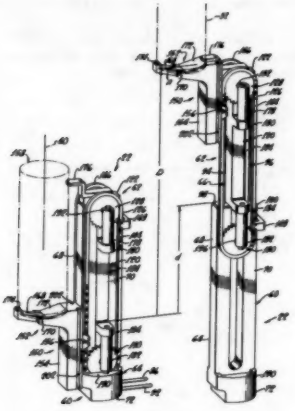
a first rammer mounted to the tank in a position forward of said cartridge pickup and parallel to said position of said pickup which is parallel to the longitudinal axis, for ramming a cartridge carried by said pickup into the one of said magazine compartments at said lowermost level which is parallel to the longitudinal axis.

4,640,182

SHELL FEEDING APPARATUS FOR GUNS

Vernet F. DeHaven, Huron, and Francis J. Warin, Oak Harbor, both of Ohio, assignors to ARES, Inc., Port Clinton, Ohio

Filed Nov. 4, 1983, Ser. No. 549,265
Int. Cl.⁴ F41F *17/16*
U.S. Cl. 89—47 **11 Claims**



1. Shell ramming apparatus for rapidly moving ammunition towards a gun, said apparatus comprising:

(a) an actuator having first and second portions, the second portion being linearly movable, relative to the first portion, a distance, d, between retracted and extended positions;

said actuator first portion comprising a cylinder having means defining laterally spaced apart, parallel first and second bores, said actuator second portion comprising first and second pistons disposed, respectively, in said first and second bores, said pistons each having a piston rod which extends beyond an open end of said bores, said actuator including means interconnecting said extending ends of the piston rods and means for delivering pressurized fluid to said first and second bores;

(b) actuating means for causing the actuator second portion to move between the retracted and extended positions at a linear velocity, v;

(c) a shell ramming member; and

(d) motion multiplyiing means mounted to the piston rod interconnecting means, said shell ramming member being connected to the motion multiplying means,

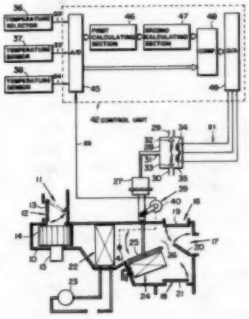
said motion multiplying means being configured for causing, in conjunction with the actuating means moving the actuator second portion from the retracted to the extended positions, movement of the shell ramming member a linear shell ramming distance, D, at a shell ramming velocity, V, said shell ramming distance, D, and velocity, V, being substantially greater than the respective actuating distance, d, and velocity, v.

4,640,183

AIR CONDITIONER

Koichi Doi, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Aug. 14, 1985, Ser. No. 765,527
Claims priority, application Japan, Aug. 21, 1984, 59-172401
Int. Cl.⁴ B60H *1/00*; E04H *14/00*
U.S. Cl. 98—2.01 **5 Claims**



1. An air conditioner comprising:

(a) a movable air mix door for adjusting the temperature of outgoing air from the air conditioner, the outgoing air temperature depending on the position of the air mix door;

(b) a combination sensor formed of a position sensor for sensing actual position of the air mix door and a temperature sensor for sensing temperature of incoming air into the air conditioner, said combination sensor generating a first signal depending on the actual position of the air mix door and on the incoming air temperature;

(c) means for generating a second signal representing a target position of the air mix door; and

(d) means for controlling the position of the air mix door in accordance with the first and second signals.

4,640,184

MOUNTING STRUCTURE FOR A ROOF DUCT

Katsuaki Matsushima; Yasuhiro Fujioka; Takeshi Sasaki; Manabu Fujine, and Kouji Yamamoto, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

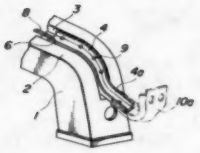
Filed Jan. 10, 1985, Ser. No. 690,122
Claims priority, application Japan, May 7, 1984, 59-66175[U]
Int. Cl.⁴ B60H *1/28*
U.S. Cl. 98—2.15 **1 Claim**

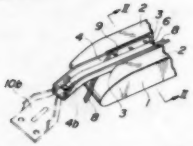
1. A detachable ventilation apparatus along a vehicle surface

capable of housing conductor cables for operating the ventilation apparatus which comprises:

conduit means for conveying air within the vehicle, said conduit means including a substantially enclosed duct having an elongated groove extending along a substantial portion of the length of an outer surface of said duct, said duct including means for diffusing the conveyed air into the vehicle;

support means extending within said elongated groove and projecting out of opposite ends thereof for supporting said conduit means and having a first end section and a second end section, said support means including a reinforcement plate and securing means for securing said conduit means to said reinforcement plate, said reinforcement plate and said outer surface defining a channel therebetween within said elongated groove for receiving the conductor cables;





bracket means affixed to said first and second end sections for removably mounting said support means and said conduit means within the vehicle, said bracket means being mounted to the vehicle to align said outer surface to abut an interior portion of the vehicle, thereby substantially concealing said elongated groove, said bracket means including a first bracket and a second bracket, said first bracket being affixed to said first end section and said second bracket being affixed to said second end section, said first bracket including an upward extension and defining a trough between said duct and said upward extension, said second bracket including a downward extension and defining a gap beneath said second end section and between said duct and said downward extension;

a support plate mounted within said gap; and

switching means for controlling the electrical operation of the conductor cables, wherein said support plate provides support for said switching means.

4,640,185

FUNNEL STOCK/SAUCE SEPARATOR

Auvin H. Joyner, 2 Walnut St., Pawling, N.Y. 12564

Filed Nov. 21, 1985, Ser. No. 800,277

Int. Cl.[4] A47J *43/28*

U.S. Cl. 99—495 **6 Claims**

1. A funnel stock/sauce separator for separating fat from liquids comprising:

(a) a funnel for storing therein said liquid which is to be separated from said fat at top of said liquid, said funnel including:

(i) a wide mouthed conical vessel, and

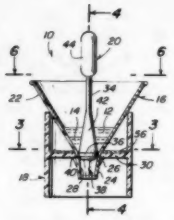
(ii) a short tapered spout with bayonet projections thereon, said spout extending downwardly from said conical vessel having an opening formed therein through which said liquid is removed from said conical vessel;

(b) a cylindrical housing with a horizontal mid-portion having a central notched hole to accommodate and secure said projections of said spout when said spout is placed and turned within said notched hole with said conical vessel sitting on top of said housing so that said housing supports said funnel onto a support surface; and

(c) a manually operated closure member positioned within said funnel for controlling outflow of said liquid through said spout, said closure member including:

(i) a stem reciprocally movable within said conical vessel;

(ii) a valve element positioned above the spout, said spout limiting the downward movement of the valve element, said valve element having diametrical cross-sectional areas approximately equal to diametrical cross-sectional area of said opening in said spout at juncture of said conical vessel; and



(iii) means for attaching said valve element to said stem whereby when said stem is moved downwardly said valve element is positioned on said opening in said spout at said juncture of said conical vessel and said liquid within said vessel is prevented from flowing through said opening in said spout and when said stem is moved upwardly said valve element is lifted up from said opening in said spout at said juncture of said conical vessel and said liquid is allowed to flow outwardly therethrough.

4,640,186

STEAM JUICE EXTRACTOR

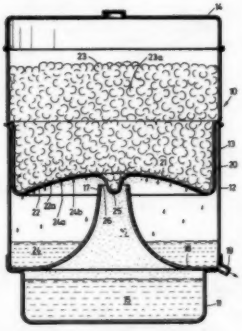
Eberhard Hackelsberger, 8767 Wehr-Oflingen, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 734,383

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418729; Dec. 7, 1984, 3444722

Int. Cl.[4] A23N *1/00*

U.S. Cl. 99—495 **13 Claims**



1. A steam juice extractor, comprising a water cup for producing a water steam; a juice collecting container arranged on said water cup, said juice collecting container having a funnel for passing the water steam and being provided with an outlet; a fruit container arranged above said juice collecting container for receiving fruits and having a bottom which in the region of said funnel is closed and in the region surrounding said funnel is provided with a plurality of sieve openings through which the steam flowing through the funnel is introduced into said

fruit container and the juice from fruits in said fruit container is dripped and flows into said juice collecting container; and a guiding and protecting body arranged on said bottom of said fruit container, said guiding and protecting body being arranged so that when said fruit container is arranged on said juice collecting container said guiding and protecting body cooperates from above with said funnel and reduces a cross section of said outlet of said funnel so that an annular opening remains for producing a high steam output speed, and when said fruit container is removed from said juice collecting container the whole cross section of said outlet of said funnel becomes unobstructed and thereby the outlet speed of the steam is lowered to a low and not dangerous value.

4,640,187

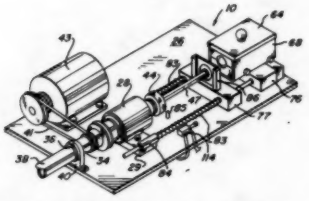
FOOD CORING DEVICE

William P. Wallick, 7478 W. 10th Ave., Lakewood, Colo. 80215, and Gary J. Hoffman, Arvada, Colo., assignors to William P. Wallick, Lakewood, Colo.

Continuation-in-part of Ser. No. 553,580, Nov. 21, 1983, abandoned. This application Jan. 31, 1985, Ser. No. 697,214

Int. Cl.[4] A23P *1/00*; A47J *25/00*

U.S. Cl. 99—538 **19 Claims**



1. An apparatus for forming bores within food products, diameters of the bores varying coresponding to the food product in which the bore is to be formed, a first bore formed within a first food product, a second food product of a diameter essentially equal to said first bore, said second food product inserted into said first bore of said first food product, said second food product having a second bore formed therein for receipt of other food products, said apparatus comprising in combination:

a mounting base having rotatably mounted thereto a longitudinally extending generally hollow connection assembly having one end operatively connected to a rotary drive means for turning said connection assembly about a longitudinal axis thereof, said connection assembly having a second end selectively connected to tubular cutting means of diameter equal to a diameter one of said first or said second bores, said tubular cutting means including a circular cutting edge at a terminal end thereof, the connection assembly and cutting means having a passageway extending along a longitudinal axis of said apparatus, said passageway in air vacuum communicaton with suction means sealingly connected to said one end of said connection assembly for removing core material from said food products along said passageway, retention means for receiving and holding said food products in a pre-set position relative to said cutting means, said retention means slidably secured to said mounting base for longitudinal movement over a fixed maximum distance therealong, said retention means further having stripping means for receiving said cutting means therethrough and for cleaning an outer surface of said cutting means on withdrawal of said cutting means from said retention means.

4,640,188

SILK SCREEN TRANSFER PRINTING APPARATUS FOR CYLINDRICAL OBJECTS

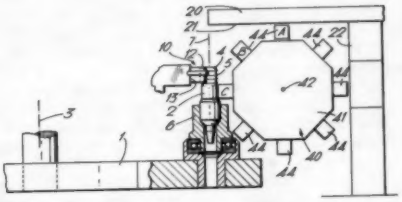
Colin Cosson, 38 Sidney Road, Rugby, Warwickshire, and Laurence E. Hopper, 34 Lauds Road, Crick, Northampton, NN6 7TJ, both of England

Filed Jun. 5, 1985, Ser. No. 741,503

Claims priority, application United Kingdom, Jun. 5, 1984, 8414295

Int. Cl.[4] B41F *17/22*

U.S. Cl. 101—39 **6 Claims**



1. Printing apparatus for printing onto a substantially cylindrical vertical surface of a body comprising: a screen printing head containing a heat-flowable ink; means for heating said printing head to render the ink flowable; means mounting the head with the screen substantially horizontal; a print transfer device, said print transfer device including a drum that is rotatable about a horizontal axis and a plurality of print transfer pads spaced about the surface of the drum, each said transfer pad having a face thereon extending parallel to the axis of the drum; means for heating each said transfer pad to maintain ink on said pad in a flowable state; means mounting the print transfer device for rotation between a first stationary position in which the face of a pad is substantially horizontal and a second stationary position in which the face of the pad is substantially vertical; means for bringing the face of the pad into contact with the printing head in said first position so as to take up ink from the printing head; and means for rolling the body about a vertical axis along the face of the pad transverse to the direction of displacement of the pad in said second position so as to deposit ink from the pad around the cylindrical surface of the body, said body being unheated such that the ink deposited on the body rapidly dries on cooling.

4,640,189

ROTARY MULTICOLOR MACHINE FOR SIMULTANEOUSLY PRINTING BOTH SIDES OF A PAPER WEB OR SHEET

Manolo Hernandez, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Continuation of Ser. No. 620,678, Jun. 14, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,995

Claims priority, application Switzerland, Jul. 26, 1983, 4084/83

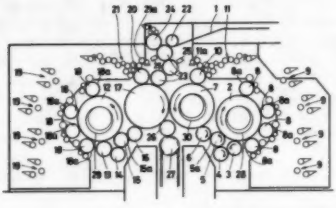
Int. Cl.[4] B41F *5/16, 5/22*

U.S. Cl. 101—177 **6 Claims**

1. A rotary multicolor machine for simultaneously printing both sides of paper webs or sheets, more particularly for printing a safety background on fiduciary documents and notably bank notes, which comprises a first pair of blanket cylinders, each blanket cylinder having arranged along its periphery a group of several cylinders each inked by an inking unit of different ink color and each adapted to cooperate with the corresponding blanket cylinder of said first pair of blanket cylinders for applying a multicolor image thereon, each one of said blanket cylinders being associated with a typographic plate cylinder and with an associated rubber cylinder, said typographic plate cylinder being in contact with said rubber cylinder and provided with a typographic plate representing the complete design to be printed and adapted to be inked by

the corresponding blanket cylinder, and a second pair of blanket cylinders cooperating together, each blanket cylinder of the second pair being associated with one of the blanket cylinders of the first pair and also with one of said typographic plate cylinders and its associated rubber cylinder, and arranged for transferring a multicolor image to one or the other side of the paper webs or sheets passing between said blanket cylinders of said second pair, and comprising means for mounting the first pair of blanket cylinders for movement away from the corresponding blanket cylinder of the second pair of blanket cylinders, means for mounting each of said typographic plate cylinders and its associated rubber cylinder for movement from a printing position to a nonprinting position and vice versa, whereby in the printing position one of said two last mentioned cylinders contacts the associated blanket cylinder of the first pair of blanket cylinders and the other of said two last mentioned cylinders contacts the associated blanket cylinder of the second pair of blanket cylinders, and in the nonprinting position each of said two last mentioned cylinders is spaced from the associated blanket cylinder of said first and said second pair of blanket cylinders, and means for converting said groups of several cylinders from selective color inking cylinders having relief areas to plate cylinders and from plate cylinders to selective color inking cylinders; and means for selectively adapting said machine to the following arrangements of adjustable or replaceable component elements:

(a) means for selectively adapting each of said groups of said several cylinders into selective color inking cylinders of which said relief areas correspond to the image portions to be colored in the various colors, and of which the number corresponds to the number of colors to be printed;



means for spacing both blanket cylinders of said first pair from said associated blanket cylinder of said second pair so as to operate as color ink collecting cylinders for inking the typographic plate of the associated typographic plate cylinder;

means for adapting each of said typographic plate cylinders and its associated rubber cylinder into their printing position so as to transfer the image from the corresponding inked typographic plate to the associated blanket cylinders of the second pair;

(b) means for selectively adapting each of said groups of said several cylinders into plate cylinders each equipped with a printing plate, the number of said printing plates for each of said groups of said several cylinders corresponding to the number of colors and designs to be printed;

means for contacting the blanket cylinders of said first pair to the associated blanket cylinder of the second pair;

wherein said typographic plate cylinders and their associated rubber cylinders have no printing function and are adapted into their nonprinting position;

(c) means for selectively adapting one of said groups of said several cylinders into selective color inking cylinders and means for selectively adapting the other of said groups of said several cylinders into plate cylinders, each provided with a printing plate;

means for spacing one of said two blanket cylinders of said first pair of blanket cylinders from said associated blanket cylinder of said second pair of blanket cylinders so as to operate as a color ink collecting cylinder for inking said associated typographic plate, said typographic plate cylinder and its associated rubber cylinder being in their printing position;

means for contacting the other of said blanket cylinders of said first pair of blanket cylinders to said associated blanket cylinder of said second pair of blanket cylinders;

wherein the typographic plate cylinder associated with said other of said blanket cylinders of said first pair of blanket cylinders, and its associated rubber cylinder, have no printing function and are adapted into their nonprinting position.

4,640,190

COAXIAL SHAFT CONNECTION FOR A PRINTING MACHINE CYLINDER

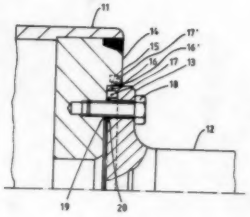
Klaus Holzapfel, Dischingen, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,044

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1984, 3431149

Int. Cl.⁴ B41F *31/26*

U.S. Cl. 101—348 **3 Claims**



1. Coaxial shaft connection for attaching a cylinder (**11**) to a shaft (**12**) both of which have the same axis of rotation, in which the cylinder is formed with an end face (**14**) and the shaft (**12**) comprises a stub shaft having a flange (**13**) extending therefrom and facing said end face,

wherein, in accordance with the invention,

the end face (**14**) is formed with a disk-shaped circular recess (**15**);

the flange (**13**) is received, at least in part, in the recess by an interengaging fit;

said circular recess (**15**) is formed with a finished planar surface (**19**) perpendicular to the axis of rotation of said cylinder (**11**) and defining a bottom of said recess;

said flange (**13**) is formed with a matching engagement planar surface (**20**) perpendicular to the axis of rotation of said shaft (**12**), and fitting against said planar surface (**19**) of said recess, thereby assuring precise alignment of said cylinder (**11**) and shaft (**12**);

the flange (**13**) has an outer diameter dimensioned to be fitted into the disk-shaped recess by an interference fit;

and the interengaging fit includes a resilient circumferential engagement lip (**16**, **16'**) defined by a groove (**17**, **17'**) formed in at least one of:

said flange (**13**) and

said end face (**14**) of the cylinder (**11**),

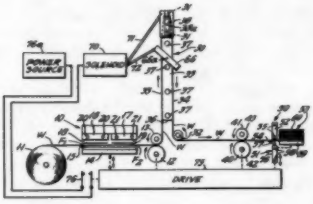
said lip being concentric with the axis of rotation of the shaft, and located spaced from said interengaging fit by a distance sufficient to provide resiliency of the material of the lip of the respective flange, or end face of the cylinder adjacent said interengaging fit; and

means (**18**) to attach the flange to said cylinder.

4,640,191
SUBLIMATION PRINTING APPARATUS

Gerald R. Bradley, c/o Packaging Systems Corporation, 317 S. Thomas Ave., Sayre, Pa. 18840

Filed Aug. 13, 1985, Ser. No. 765,272
Int. Cl.[4] B41M 5/035; F26B 3/22
U.S. Cl. 101—470 3 Claims



1. Apparatus for printing discrete, separated patterns or indicia on a web of indefinite length, said apparatus comprising:

a printing station having printing means for printing a pattern or indicia on said web;

a heating tower for receiving and heating the web on which a pattern or indicia has been printed, thereby, curing said pattern or indicia;

stepping means for periodically moving said web stepwise past said printing means and said heating tower;

web control means adjacent said heating tower for contacting said web with surfaces of said tower during movement of said web and for separating said web from said surfaces during pauses in movement of said web;

said web control means comprising a pair of spaced rollers mounted adjacent one end of said heating tower for transferring said web from one side of said tower to the other side thereof, said rollers being spaced from each other by a distance greater that the distance from said one side of said tower to said other side thereof and being pivotable from a first position in which a plane containing the axis of said rollers is parallel or substantially parallel to the length of said tower and to a second position in which said plane extends transversely to the length of said tower, whereby in said first position of said rollers, said web contacts said surfaces of said tower and in said second position of said rollers, said web is spaced from said surfaces; and

control means for synchronizing the operation of said printing means, said stepping means and said web control means so that said printing means prints said pattern or indicia and separates said web from said surfaces during intervals between movement of said web by said stepping means and operates said web control means to cause said web to contact said surfaces during movement of said web by said stepping means.

4,640,192
MEANS FOR SECURING TUBES TO A TUBE SHEET

Henry G. Nash, 3924 S. Jamestown, Tulsa, Okla. 74135

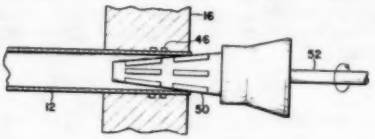
Filed Nov. 19, 1985, Ser. No. 799,437
Int. Cl.[4] F42B 1/02
U.S. Cl. 102—307 4 Claims

1. A reusable device for fastening a tube to a tube sheet having holes into which the tube is placed which comprises:

a detonator for detonating an explosive for generating gas at high pressure;

a barrel insertable into said holes and having a perforated section attached to said detonator for receiving said gas, said detonator being exterior of said barrel;

an exterior disc-shaped stop surrounding said barrel for contacting an area of said tube sheet surrounding a hole;



a reusable disc-shaped interior stop on said barrel at the end of said perforated section opposite the exterior stop and being of about the interior diameter of said tube.

4,640,193
CHEMILUMINESCENT LIGHT CONTAINER

Anthony Koroscil, Escambia, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 26, 1985, Ser. No. 813,345
Int. Cl.[4] F42B 4/26
U.S. Cl. 102—336 8 Claims

1. A hollow container adapted for insertion into a device for use in creating a signal and having fitted into the hollow space thereof, in the following sequence,

(a) a fuse or percussion cap,

(b) a propellant,

(c) a chemiluminescent light activator solution,

(d) a chemiluminescent light fluorescer solution,

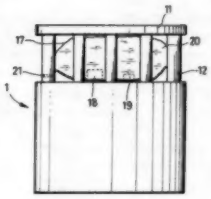
(e) a reactive enhancer capable of catalyzing the reaction product produced upon contact of (c) and (d) which occurs upon detonation of said fuse or cap and

(f) a sealing means.

4,640,194
AIRBORNE ARRANGEMENT FOR PRODUCING A PROJECTILE

Wolfram Witt, Duesseldorf, and Herbert Scholles, Meerbusch, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 676,661
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343267
Int. Cl.[4] F42B 25/20, 25/08, 1/02; F42C 13/04
U.S. Cl. 102—425 4 Claims



1. An improved airborne arrangement for producing a projectile having an effective load, a projectile-forming layer and a target-recognition device which encompasses an antenna, the improvement comprising

said arrangement including a housing having a longitudinal axis;

said antenna being outwardly axially slidably mounted in said housing; and

means supporting said antenna, said support means being equi-angularly disposed about the periphery of said housing, guide means in said housing, said support means being slidably mounted in said guide means, whereby said an-

tenna is movable from an inoperative position to an operative position by outwardly sliding said support means in said guide means, wherein,

an inflatable container is mounted between said housing and said antenna, which said container is adapted to be inflated by a gaseous mixture coming from an internal pressure source.

4,640,195

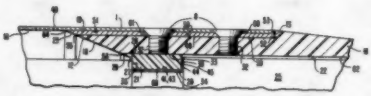
ROCKET LAUNCHING CARTRIDGE CASE AND ASSEMBLY

Ralph F. Campoli, Dover, N.J., assignor to General Defense Corporation, Wharton, N.J.

Continuation of Ser. No. 565,655, Dec. 27, 1983, abandoned. This application Apr. 11, 1986, Ser. No. 851,898

Int. Cl.[4] F42B 5/02

U.S. Cl. 102—430 **18 Claims**



1. Apparatus for connecting a rocket assembly to a cartridge case of the type having a primer-receiving closed end and a projectile-receiving open end, for launching the rocket assembly from a conventional weapon, said rocket assembly having a rocket with a diameter conforming to the bore of the weapon, and also having a nozzle end, the rocket assembly being substantially greater in length than the projectile conventionally employed with the cartridge case in the weapon, the apparatus comprising:

a cylindrical extension member secureable to the cartridge case at the open end, said extension member and the cartridge case together conforming to the shape and dimensions of the cartridge receiving chamber of the weapon, said extension member also being configured to slideably receive the rocket assembly,

wherein said extension member includes a portion having an axial bore of essentially constant diameter for receiving the rocket assembly, said extension member portion extending within said cartridge case past said open end,

locking means associated with said extension member for releasably retaining the rocket assembly when the latter is inserted into said extension member, said locking means being forcefully releasable in response to the rocket assembly being launched;

the apparatus further including means associated with said extension member for positioning said rocket assembly within extension member bore to achieve a predetermined overall rocket round length, and

sleeve means positioned between the cartridge case and said cylindrical extension member and expandingly engageable with the cartridge case for preventing leakage past said extension member of the gases generated in the cartridge case during launch of the rocket assembly.

4,640,196

TRACK MEMBER AND TRACK FOR CONVEYOR TROLLEYS

Clarence A. Dehne, Farmington Hills, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Continuation of Ser. No. 343,392, Jan. 28, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,796

Int. Cl.[4] B61B 12/02; B65G 39/00

U.S. Cl. 104—94 **10 Claims**

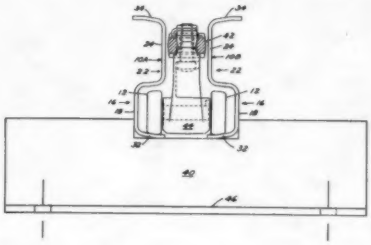
1. A reversible and invertable track member adapted to form one-half of a track for vertically supporting the wheels of conveyor trolleys, said conveyor trolleys consisting of a plurality of first conveyor trolleys each having wheels of one diameter or consisting of a plurality of second conveyor trolleys each having wheels of another diameter, said track member comprising:

a first longitudinally extending trackway having a first vertical web and a first pair of longitudal track surfaces extending transversely from the first vertical web in opposed vertically spaced relation;

a second longitudinally extending trackway joined directly to the first trackway in vertically superimposed oppositely facing relation, the second trackway including a second vertical web offset vertically and transversely with respect to the first vertical web, and a second pair of track surfaces extending transversely from the second vertical web in opposed vertically spaced relation;

said first vertical web having a length such that said first pair of track surfaces are spaced apart a distance corresponding to the diameter of the wheels of said first trolleys, and said second vertical web having a length such that said second pair of track surfaces are spaced apart a distance corresponding to the diameter of the wheels of said second trolley wheels;

said track being formable by a pair of said track members



assembled in any one of the following longitudinally parallel, transversely spaced relationships:

(a) the first trackways of said pair of track members face each other and form said track for the wheels of said first conveyor trolleys, and said second vertical webs of said pair of track members face each other and are disposed vertically below said track;

(b) the second trackways of said pair of track members face each other and form said track for the wheels of said second conveyor trolleys, and said first vertical webs of said pair of track members face each other and are disposed vertically below said track;

(c) the first trackways of said pair of track members face each other and form said track for the wheels of said first conveyor trolleys, and said second vertical webs of said pair of track members face each other and are disposed vertically above said track; and

(d) the second trackways of said pair of track members face each other and form said track for the wheels of said second conveyor trolleys, and said first vertical webs of said pair of track members face each other and are disposed vertically above said track.

4,640,197

ROCKER ARM ASSEMBLY WITH A FIXING COLLAR FOR AN AERIAL TRAMWAY INSTALLATION

René Brian, Fontaine, France, assignor to Pomagalski SA, France

Filed Mar. 27, 1985, Ser. No. 716,445

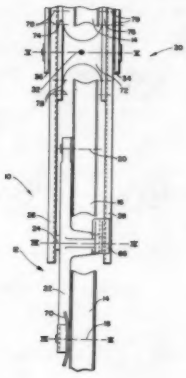
Claims priority, application France, Apr. 13, 1984, 84 06257

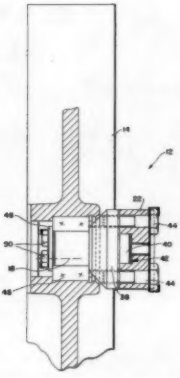
Int. Cl.[4] B61B 7/00, 12/00, 12/06

U.S. Cl. 104—179 **3 Claims**

1. An aerial tramway installation including a rope, load-bearing hanger arm grips coupled to the rope, and a rope supporting device comprising rocker assembly arms, rope support sheaves having an external side, said hanger arm grips passing

said external side, and an internal side, the rocker assembly arm being disposed on said internal side, each sheave having a bearing and a rotation spindle on which the bearing is mounted, each rocker assembly arm supporting at ends thereof a sheave rotation spindle, a pair of straight side plates in the form of a cover having at ends thereof a pivoting spindle fitted between said plates, said rocker assembly arm being pivotally





mounted on said spindle, said sheave rotation spindles having internal sheave sides, a fixing collar and a centering pin, said rocker assembly arm having an orifice into which said centering pin is fitted with a small amount of clearance and a bearing face against which said collar is in abutment for cantilevered mounting of the rotation spindle from the rocker assembly arm and fixing means to secure said collar to said rocker assembly arm.

4,640,198

AXLE CONTROL MECHANISM FOR RAIL VEHICLES

Otmar Häupl, Kassel, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,417

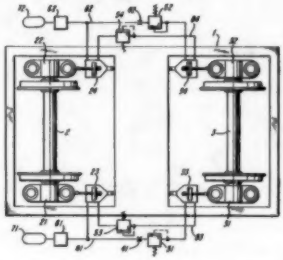
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331559

Int. Cl.⁴ B61F *5/30, 5/38*

U.S. Cl. 105—168 **6 Claims**

1. In an axle control mechanism for rail vehicles having at least one truck frame, which has a longitudinal dimension in a predetermined direction and two wheel sets therewith, each wheel set having an axle, and a journal box and journal box housing at each end of each axle; the two journal boxes of a given wheel set being interconnected with the respectively opposite journal boxes of the other wheel set by means of a hydraulic system; a movement of one of the wheel sets automatically bringing about a "self-orienting" movement of the other wheel set; the improvement therewith which comprises:

hydraulic cylinders, each having a double-acting piston with a working chamber, each working chamber including an inner chamber portion connected to the frame and an outer chamber portion on the opposite side of the piston; each hydraulic cylinder being operatively connected via its piston to a respective said journal box housing of the two wheel sets of a given truck frame; said hydraulic cylinders being disposed in longitudinal pairs in the direction of said longitudinal dimension of said truck frame,



and effecting connection of the latter to said journal box housings; in a given truck frame, two hydraulic cylinders being successively located in-line on each longitudinal side thereof; and

hydraulic lines for respectively interconnecting an inner chamber portion of a given hydraulic cylinder to the outer chamber portion of the other hydraulic cylinder located on the same longitudinal side of said truck frame to establish hydraulic circuit communication directly between said last-mentioned chamber portions so that a piston movement in a given one of the in-line hydraulic cylinders on a given longitudinal side of said truck frame causes an oppositely directed piston movement in the other hydraulic cylinder on that longitudinal side of said truck frame, thus accomplishing coupled opposite turning movements of the two wheel sets of a given truck frame during movements in curve travel.

4,640,199

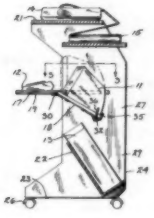
MOBILE TERMINAL MOUNTING STAND

Donald J. Zigman, 5569 S. 116th St., Hales Corners, Wis. 53130

Filed Mar. 15, 1985, Ser. No. 712,601

Int. Cl.⁴ A47B *9/14*

U.S. Cl. 108—6 **6 Claims**



1. A mounting stand for supporting a video display terminal,

keyboard, disc drive, printer, and printer paper on a floor comprising:

a first portion defining a forward keyboard support surface and a rearward VDT support surface, said VDT support surface being hingedly connected to said keyboard support surface;

means for adjusting the inclination of said VDT support surface relative to said keyboard support surface;

a second portion defining a paper support surface at a height above said VDT support surface, at least a portion of said paper support surface being vertically aligned with a portion of said VDT support surface;

a third portion defining a printer support surface above said paper support surface wherein at least a portion of said printer support surface is forward of said VDT support surface;

a fourth portion defining a disc drive support member at a height below said VDT support surface, at least a portion of said disc drive support member being rearward of said keyboard support surface;

frame support means interconnecting said first, second, third and fourth portions; and

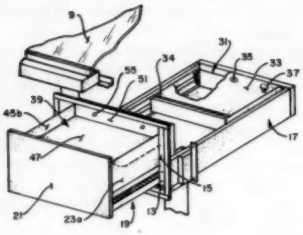
roller means operatively connected to the frame support means to contact the floor, said roller means being disposed at two places rearward of the VDT support surface, one on each side of the mounting stand, and at two places forward of the VDT support surface, one on each side of the mounting stand.

4,640,200

PASS-THROUGH TRANSACTION DRAWER WITH REMOVABLE DEAL TRAY

Daniel E. Richardson, St. Louis County, Mo., assignor to Shure Manufacturing Corporation, St. Louis, Mo.

Filed Jun. 11, 1984, Ser. No. 619,383
Int. Cl.[4] E06B 7/32
U.S. Cl. 109—19 **6 Claims**



1. A transaction drawer, comprising:

a frame adapted to be installed in an opening in the wall of a structure, said frame including a runway extending into the structure;

a drawer movably mounted on said runway and being selectively movable by an attendant within said structure between at least a first retracted position in which said drawer is within said structure such that said opening is closed, and a second extended position in which said drawer projects out beyond the wall of the structure permitting a customer on the outside of the structure to have access to the interior of the drawer, said drawer having a relatively large depth dimension for receiving relatively large items along said interior;

a deal tray carried by said drawer, said deal tray having a relatively shallow depth, said deal tray being mounted to close the interior of said drawer, said deal tray being removable from said drawer by the attendant when said drawer is in the retracted position, said deal tray including means for preventing removal of said deal tray by a person on the outside of said building when said drawer is in its extended position, said means for preventing removal of said deal tray from said drawer including a downwardly extending lip on the attendant side of said deal tray engageable with said drawer so as to prevent relative forward movement of said deal tray with respect to said drawer, and means at the opening of said structure coacting with the lip of said transaction drawer to prevent upward movement of said deal tray in the extended position of said drawer; and

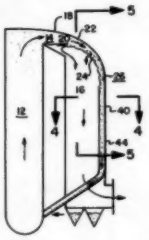
a cash box mounted on the inner end of said runway, said cash box being disposed rearwardly of said drawer when said drawer is in its first position, said cash box having a depth dimension substantially less than the depth dimension of said drawer so that said cash box is at least partially blocked from view from the customer side of said structure when said drawer is in its first position.

4,640,201

FLUIDIZED BED COMBUSTOR HAVING INTEGRAL SOLIDS SEPARATOR

Myron L. Holmes, Simsbury, and Leo A. Smolensky, W. Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 30, 1986, Ser. No. 858,138
Int. Cl.[4] F23G 5/00, 7/00
U.S. Cl. 110—245 **7 Claims**



1. A fluidized bed combustor system for combusting a particulate fuel comprising:

a. a furnace enclosure defining a combustion chamber for burning a particulate fuel in a fluidized state in a fluidizing gas to generate a hot flue gas and having a gas outlet above said bed for passing the hot flue gas from the combustion chamber;

b. a flue gas duct disposed downstream of the furnace enclosure having an inlet for receiving the flue gas generated in the combustion chamber;

c. separator means for separating particulate solids carried over from the combustion chamber in the flue gas, said separator means comprising an arcuate duct having an inlet opening to the gas outlet of the furnace enclosure for receiving the hot flue gas from the combustion chamber and an outlet spaced from said inlet and interconnected to said inlet by a curvilinear inner wall, a curvilinear outer wall, and a pair of spaced sidewalls extending therebetween, a portion of the curvilinear inner wall being disposed across the inlet to flue gas duct, said portion having a plurality of openings therein providing a flow area through which a first portion of the hot gas passes from the arcuate duct of the separator means through the inlet to the flue gas duct; and

d. solids collection means opening to the outlet of the arcuate duct of the separator means for receiving a second portion of the flue gas together with the particulate solids separated from the first portion of the flue gas passing through the inner wall of the arcuate duct of the separator means.

4,640,202

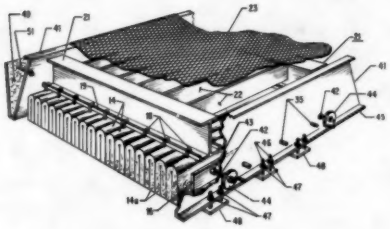
READILY REPAIRABLE AND LIGHTWEIGHT COVER FOR A HEATED VESSEL

Raymond J. Schraff, Cleveland; Thomas M. Miller, North Olmsted, and Nicholas Labas, Solon, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 635,441, Jul. 30, 1984, Pat. No. 4,524,702. This application Mar. 26, 1985, Ser. No. 716,029

Int. Cl.[4] F23M *5/00*

U.S. Cl. 110—336 **12 Claims**



1. A ceramic fiber insulation module adapted for repairing a shrinkage compensating insulation cover structure having a support frame supporting a matrix of discrete, folded ceramic fiber insulation units in form-stable condition, with said insulation being under externally applied compression while being linked, by means of insulation support means, in upwardly moveable as well as at least substantially swinging engagement with said support frame, said insulation module comprising:

at least one unit of folded ceramic fiber insulation in form-stable condition;

at least one support element in interengagement with said folded fiber unit within a fold thereof;

first linking means securely fastened to said support element; and

second linking means supportingly engaging said support element without being securely fastened thereto;

wherein said first and second linking means protrude directly from said support element beyond the ceramic fiber and terminate therebeyond in a head configured for said moveable engagement with said support frame.

4,640,203

METHOD AND APPARATUS FOR BURNING COMBUSTIBLE WASTE MATERIALS

Albrecht Wolter; Rolf Hartmann, both of Cologne; Horst Herchenbach, Hennef, and Alexander Grisar, Mainz-Finthen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt Deutz Aktiengesellschaft and Dyckerhoff Engineering GmbH, both of, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,246

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1984, 3444073

Int. Cl.[4] F23G *5/00*

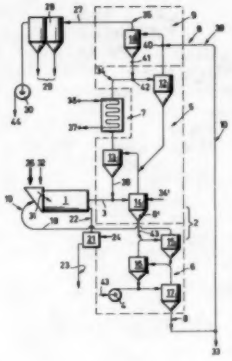
U.S. Cl. 110—346 **23 Claims**

1. A method for burning combustible waste materials and the like which comprises:

introducing said waste materials into a rotary tubular kiln to incinerate said waste materials and produce a high temperature flue gas,

transferring at least a portion of the heat contained in said flue gas to a solid heat exchange medium which has the ability of chemically or adsorptively bonding noxious substances released during the incineration in a heating stage,

thereafter transferring heat from said solid heat exchange medium to incoming combustion air to heat the same to a temperature in the range from 300° to 800° C., and



introducing the thus preheated combustion air into said kiln in sufficient quantities to incinerate said waste materials.

4,640,204

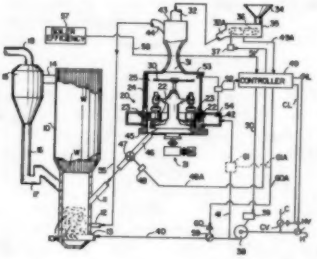
FLUIDIZED BED COMBUSTION APPARATUS AND METHOD OF OPERATING SAME

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Jun. 9, 1986, Ser. No. 871,856

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **11 Claims**



1. In a coal burning boiler having a dense bed column with a closed end and opening into a combustion chamber, and a source of coal, the improvement comprising:

(a) coal processing mill means adapted to receive coal from said source and having a first outlet conduit connected to said dense bed column adjacent the closed end and a second outlet conduit connected to said dense bed column spaced from said connection of said first outlet conduit to said dense bed column;

(b) means supplying air into said coal processing mill means for stripping fine particulate fractions and delivering the same into said first outlet conduit for injection into said dense bed column;

(c) means in said second outlet conduit connection operable to feed coarse particulate fractions into said dense bed column for supplying coarse coal fractions into said column spaced from said injection of fines into said column; and

(d) air supply means connected into said dense bed column adjacent said closed end of said dense bed column for

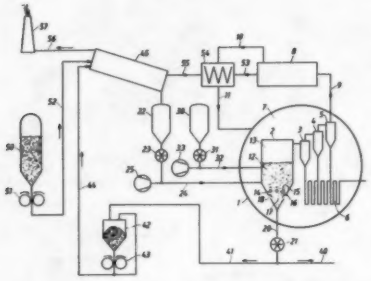
fluidizing the fine and coarse coal fractions in said dense bed column.

4,640,205

METHOD OF DRYING GRANULAR FUEL IN A FLUIDIZED BED COMBUSTION PLANT AND A COMBUSTION PLANT WITH A DRYING DEVICE

Roine Brännström, Finspong, Sweden, assignor to Asea Stal AB, Västerås, Sweden

Filed Jul. 2, 1985, Ser. No. 751,095
Claims priority, application Sweden, Jul. 11, 1984, 8403665
Int. Cl.[4] F22B *1/00*
U.S. Cl. 110—347 16 Claims



1. A method of improving the pneumatic conveying properties of a particulate fuel fed to a pneumatically fluidized combustion bed in a combustion chamber, the fuel particles prior to feeding containing moisture and the fluidized combustion bed containing particulate bed material comprising calcium carbonate, said method comprising withdrawing a fluidized portion of said bed material directly from said pneumatically fluidized combustion bed in the combustion chamber, subjecting said withdrawn portion to calcining conditions to at least partially calcine said bed material to provide calcium oxide in said withdrawn portion, crushing said withdrawn bed material to expose said calcium oxide, mixing said crushed bed material with said fuel particles containing moisture to dry the particulate fuel by reacting said calcium oxide with said moisture at the surface of said fuel particles, contacting said mixture of crushed bed material and moist particulate fuel with a supply of drying gas to aid in the drying of said fuel, and supplying said mixture of crushed bed material and dried particulate fuel to the combustion chamber via a pneumatic conveying means, the drying provided by said crushed bed material and said drying gas reducing the moisture content of said particulate fuel sufficiently to prevent clogging of said pneumatic conveying means.

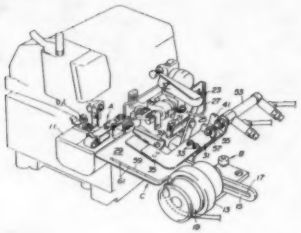
12. An apparatus for improving the pneumatic conveying properties of a particulate fuel fed to a pneumatically fluidized combustion bed in a combustion chamber, the fuel particles prior to feeding containing moisture and the fluidized combustion bed containing particulate bed material comprising calcium carbonate, said apparatus comprising means for withdrawing a fluidized portion of said bed material directly from said pneumatically fluidized combustion bed in the combustion chamber, means for subjecting said withdrawn portion to calcining conditions to at least partially calcine said bed material to provide calcium oxide in said withdrawn portion, means for crushing said withdrawn bed material to expose said calcium oxide, mixing means for mixing said crushed material with said fuel particles containing moisture to dry the particulate fuel by reacting said calcium oxide with said moisture at the surface of said fuel particles, means for supplying a drying gas to said mixing means to aid in the drying of said particulate fuel, and pneumatic conveying means for supplying said mixture of crushed bed material and dried fuel to the combustion chamber, the drying provided by said crushed bed material and said drying gas reducing the moisture content of said particulate fuel sufficiently to prevent clogging of said pneumatic conveying means.

4,640,206

HEMMING APPARATUS

Masahiko Nishikawa, Osaka, Japan, assignor to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan

Filed Aug. 20, 1985, Ser. No. 767,408
Claims priority, application Japan, Aug. 21, 1984, 59-127179[U]; Oct. 18, 1984, 59-157946[U]
Int. Cl.[4] D05B *35/04*
U.S. Cl. 112—143 16 Claims



1. A hemming apparatus for a sewing machine which creates an S-shaped hem in a piece of cloth, comprising a hem folding attachment supported on a machine bed in front of a needle dropping point and an aiding apparatus for hemming disposed in front of said hem folding attachment so as to prefold the hem into said S-shape, said aiding apparatus for hemming including:

(a) a free roll supported for rotation about an axis on a front side of said machine bed,

(b) position setting means for setting the position of an edge of the cloth on said free roll, said position setting means being supported on or near said free roll and being engageable with the edge of the cloth, the edge of the cloth extending from said free roll toward said hem folding attachment,

(c) fitting means for engaging an upper surface of the hem,

(d) an under guide plate engageable with a lower surface of the hem, and

(e) a base guide disposed above said under guide plate a predetermined distance, said fitting means, said under guide plate and said base guide being disposed between said hem folding attachment and said free roll and forming the hem gradually into the prescribed S-shape as the cloth advances from said free roll to said hem folding attachment, an upper side fold of the hem having a width determined by the distance between an end surface of said free roll and said position setting means in cooperation with said base guide, and an underside bent section of the hem being folded gradually more deeply beneath said upper side fold by said under guide plate and said fitting means in cooperation with said free roll as the cloth advances toward said hem folding attachment, said fitting means moving the underside bent section of the cloth progressively farther between said base guide and said under guide plate as the cloth advances.

4,640,207

DETACHABLE GUIDE FOR A SEWING MACHINE OPERATING STATION

Michael O'Keefe, and John R. Fox, both of South Yorkshire, United Kingdom, assignors to S.R. Gent plc, England

Filed Jul. 15, 1985, Ser. No. 754,767
Int. Cl.[4] D05B *33/00*
U.S. Cl. 112—236 15 Claims

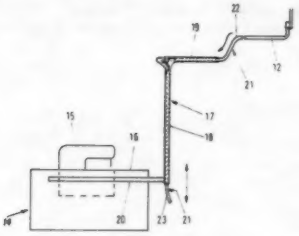
1. A sewing machine operating station for use with an over-

head conveyor system having a trolley movable therealong and provided with a delivery arm from which partly-formed garments can be suspended, for delivery to the operating station, in which the operating station comprises:

a table;

a sewing machine mounted in or on the table;

a working surface adjacent to the sewing machine and on which a partly-formed garment can rest while undergoing a sewing operation;



a guide mounted on the table and having a guide portion which extends generally horizontally over the working surface; and

means for statically coupling a free end of the guide portion with the delivery arm of the trolley in order to permit sliding transfer of a partly-formed garment from the delivery arm to a suspended position on the guide portion.

4,640,208

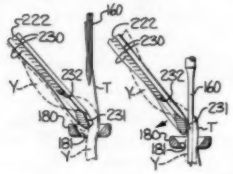
METHOD AND APPARATUS FOR FORMING DECORATIVE FABRICS

Julian H. Glenn, High Point, N.C., and Douglas J. Glenn, P.O. Box 156, Wallburg, N.C. 27373, assignors to Douglas J. Glenn, Wallburg, N.C.

Division of Ser. No. 724,101, Apr. 17, 1985. This application Jun. 27, 1986, Ser. No. 879,424

Int. Cl.⁴ D05B *3/12*

U.S. Cl. 112—265.1 **9 Claims**



1. A method of forming a decorative textile fabric from a substrate and an effect yarn which comprises guiding the effect yarn in a predetermined path of travel to a position adjacent a vertically reciprocating needle of a sewing machine while longitudinally compressing the effect yarn to expand the cross-sectional width of the effect yarn by engaging the effect yarn by the needle and by stitching thread carried by the needle during the downward stroke of the needle and while causing the stitching thread to stitchingly secure the compressed effect yarn to the substrate.

4,640,209

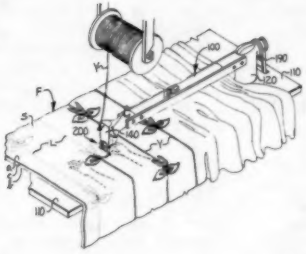
DECORATIVE FABRICS

Julian H. Glenn, High Point, N.C., and Douglas J. Glenn, P.O. Box 156, Wallburg, N.C. 27373, assignors to Douglas J. Glenn, Wallburg, N.C.

Filed Apr. 17, 1985, Ser. No. 724,101

Int. Cl.⁴ B32B *7/08*

U.S. Cl. 112—429 **11 Claims**



1. A textile fabric comprising a substrate and an effect yarn arranged on said substrate in a predetermined manner, said effect yarn being in a longitudinally compressed bulked condition imparting an expanded cross-sectional width to the effect yarn, and stitching thread securing said effect yarn to said substrate in said compressed, bulked condition, whereby there is imparted to the fabric an appearance attendant to an effect yarn much larger than that actually present on the fabric.

4,640,210

COMPUTER CONTROLLED SEWING MACHINE

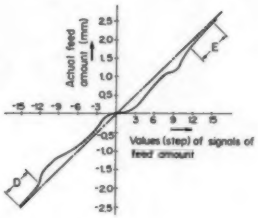
Hideaki Takenoya; Mikio Inamori, both of Tokyo, and Eiichi Shomura, Hachioji, all of Japan, assignors to Janome Sewing Machine Co, Ltd., Tokyo, Japan

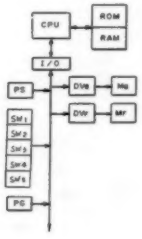
Filed May 11, 1984, Ser. No. 609,562

Claims priority, application Japan, May 11, 1983, 58-80966

Int. Cl.⁴ D05B *3/02*

U.S. Cl. 112—456 **2 Claims**





1. A sewing machine having a microcomputer including

memory stitch control data for a plurality of different patterns to be stitched, including a predetermined number of specific patterns of comparatively many stitches, pattern selecting means including a plurality of pattern selecting switches selectively operated to sequentially read out the stitch control data specific to the selected pattern to control a needle position control motor and a fabric feed control motor to thereby produce the selected pattern, said sewing machine comprising a predetermined number of feed adjusting switches provided within said sewing machine to be individually set ON or OFF in dependence upon the formation result of said specific patterns, each of said specific patterns having at least three conditions including one in which each is stitched as expected in accordance with the values of the corresponding stitch control data, another in which each is stitched as deformed due to the accumulated errors in the forward fabric feeding amount and another in which each is stitched as deformed due to the accumulated errors in the rearward fabric feeding amount, said feed adjusting switches being selectively set ON or OFF individually to produce different signals in dependence upon the combinations of switches thus set, so as to cover said three conditions which may be taken by each of said specific patterns, wherein said memory further stores correcting data respectively responsive to said signals produced from said feed adjusting switches so set to thereby modify said stitch control data for a selected pattern, said modified data controlling said fabric feed control motor.

4,640,211

ADJUSTMENT FIXTURE FOR WISHBONE BOOMS BOARD-SAILING DEVICES

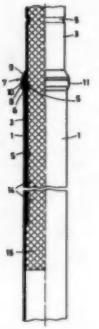
Marc Namur, Darmstadt-Eberstadt, Fed. Rep. of Germany, assignor to Schutz-Werke GmbH & Co. KG, Selters, Fed. Rep. of Germany

Filed Mar. 20, 1985, Ser. No. 714,061

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410152

Int. Cl.[4] B63H *9/08*

U.S. Cl. 114—97 **5 Claims**



1. In a wishbone boom of the type comprising two main tubes joined at an acute angle, said main tubes each comprising an integral end portion having an end surface, and two end tubes telescopingly adjustable in said main tubes, said end tubes comprising a plurality of spaced, circumferential grooves; the improvement comprising an adjustment fixture comprising: an O-ring adapted to be received in any one of said plurality of grooves; and an annular sleeve adapted to be radially interposed between said end portion of said main tube and said end tube, said annular sleeve comprising a radially outwardly extending portion designed to abut against said end surface of said main tube and a conical portion extending radially inward and axially from said abutment portion, said O-ring being formed integrally with said annular sleeve axially opposite said abutment portion, and said O-ring extending radially inwardly of said annular sleeve.

4,640,212

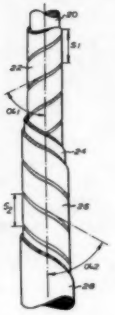
ROPE AND A MOORING DEVICE, PARTICULARLY FOR CLAMPING GOODS MOORING SHIPS AND ANCHORING FLOATING LANDING STAGES, BUOYS, NAVIGATION MARKS AND THE LIKE

Bertil Brandt, Paris, France, assignor to Socared S.A., Geneva, Switzerland

Continuation of Ser. No. 917,757, Jun. 21, 1978, abandoned. This application Jun. 24, 1980, Ser. No. 162,462

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **3 Claims**



1. A mooring device for anchoring floating landing stages, buoys, navigation marks and the like, comprising two floating bodies of relatively great displacement, and means connecting each of said floating bodies to one or more stationary anchorages placed on the sea bottom, wherein said means comprises a rigid tubular arm which is rigidly connected to the floating bodies by stays and projects downwardly from said bodies, said two floating bodies being placed on either side of said arm, an elastomer rope being connected to at least one stationary anchorage and extending into and through said tubular arm and being attached to the upper end thereof, wherein said rope has a core of elastomeric material, a fiber reinforcement disposed around said core, and an outer covering layer of elastomeric material, said elastomeric material in said core and said covering layer comprising synthetic rubber, wherein the fiber reinforcement comprises two strip layers of a material considerably less elongatable than the elastomeric material of said core, which strip layers are helically wound about the core in opposite directions, each with a reinforcement angle of 50°–65° between the longitudinal axis of the rope and the reinforcement projected at right angles thereto, and wherein said strip layers are separated from each other by a continuous layer of elastomeric material.

4,640,213

SIGNAL FLAG APPARATUS FOR WATER SKIING

Steven H. Lugo, 5157 W. Joan de Arc, Glendale, Ariz. 85304

Filed Jan. 14, 1985, Ser. No. 691,282

Int. Cl.[4] G08C *5/00*

U.S. Cl. 114—253 **14 Claims**

1. A signal flag apparatus for use on a boat that is towing a water skier, said apparatus comprising:

(a) tow line means for coupling to a boat for towing a water skier, said tow line means being taut when tension is applied thereto by the skier and being slack in the absence of skier applied tension;

(b) a flag raising mechanism for mounting on the transom of the boat and including,

I. pivot means having a substantially horizontal first position and a substantially vertical second position,

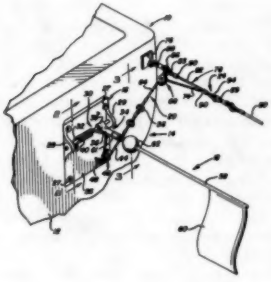
II. biasing means for yieldably urging said pivot means to the second position thereof;

(c) a flag assembly demountably connected to said pivot means for movement therewith; and

(d) coupling cable means for connection between said pivot means and said tow line means for moving said pivot means to its first position when tension is applied to said tow line means and allowing said biasing means to move said pivot means to its second position when the tension is removed from said tow line means, said cable coupling means including,

I. a leader line having one end connected to said pivot means and having an opposite end,

II. a first pulley means mounted on said flag raising mechanism below said pivot means, said first pulley means being adapted for free swivel movement and having said leader line in engagement therewith,



III. an elongated cable having an intermediate loop formed therein to separate it into an extension cable segment having an extending end and a control cable segment having an extending end,

IV. means on the extending end of the extension cable segment of said elongated cable for demountable connection to the boat,

V. a second pulley means connected to the extensio cable segment of said elongted cable proximate the extending end thereof, said second pulley means being adapted for free swivel movement and having the control cable segment of said elongated cable in engagement therewith, and

VI. means on the extending end of the control cable segement of said elongated cable for demountable connection to the opposite end of said leader line.

4,640,214

MODULAR MULTI-STORAGE BUILDING

John H. Bruns, 8251 SE. 26th Ave., Mercer Island, Wash. 98040

Filed Jan. 18, 1985, Ser. No. 692,770

Int. Cl.⁴ B63B *35/44*

U.S. Cl. 114—263 **39 Claims**

1. In a building, a cell construction, comprising:

wall means defining a hexahedral building cell which narrows in width from a first end to a second end,

said wall means comprising a pair of spaced apart vertical sidewalls which converge together from the first to the second end of the cell,

said wall means further including a pair of top sections which slope upwardly and inwardly from the sidewalls of the cell to an apex whereat they are connected together,

a pair of bottom sections which slope downwardly and inwardly from the sidewalls of the cell to a valley whereat they are connected together,

each said vertical sidewall including an inboard end located between the first and second ends of the cell, and

said wall means defining an upper and a lower cantilever beam on each side of the cell, each projecting from the inboard end boundary of a vertical sidewall towards the second end of the cell,

with the regions located vertically between the upper and lower cantilever beams and horizontally between the inboard ends of the vertical sidewalls and the second end of the cell being open regions in the vertical sidewalls.

4,640,215

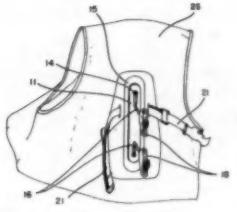
CONVERSION ADAPTER FOR BUOYANCY COMPENSATOR VEST

George G. Purifoy, Jr., 206 Lockwood Dr., Morehead City, N.C. 28557

Filed Jan. 31, 1986, Ser. No. 824,639

Int. Cl.⁴ B63C *11/46*

U.S. Cl. 114—315 **10 Claims**

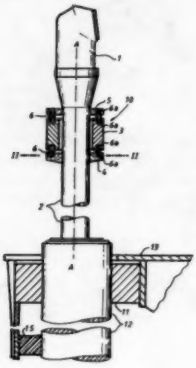


1. In a buoyancy compensator vest having a single tank mounting base, the improvement comprising: a two tank conversion adapter including a base plate; securing means for mounting said base plate on said single tank mounting base; elongated, rod-like members secured to and outwardly extending from said base plate; a pair of spaced, interconnected tanks mounted on either side of said rod-like members; wedge means mounted on the outer end of said rod-like members for engaging said tanks; and means for releasably tightening said wedge means against said pair of interconnected tanks whereby a buoyancy compensator vest designed for use in conjunction with a single tank can be readily converted to mount interconnected double tanks.

4,640,216
DEVICE FOR REDUCING VIBRATIONS OF PERISCOPES

Eike Lehmann, Mühlenberg, and Reiner Jannusch, Bergenring, both of Fed. Rep. of Germany, assignors to Howaldtswerke-Deutsche Werft, Aktiengesellschaft, Hamburg und Kiel, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,391
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433397
Int. Cl.[4] B63G *8/38*
U.S. Cl. 114—340 21 Claims



1. An apparatus for a submarine which damps vibrational deflections of a periscope which is extendable from and retractable into said submarine when in use in an aqueous medium about said submarine, said periscope having:

an uppermost portion and a lower portion;

said damping apparatus being mounted at said uppermost portion of said periscope, said damping apparatus comprising:

damping mass means for storing kinetic energy and potential energy resulting from vibrational deflections of said periscope;

said damping apparatus for damping said vibrational deflections of said periscope, when said submarine is in motion, with respect to said aqueous medium;

at least one damping element for damping the stored energy of said damping mass means;

means for mounting said damping apparatus onto said periscope;

said damping mass means and said at least one damping element being moveable mounted at said mounting means, whereby said damping mass means is subject to vibratory deflection in response to vibrating deflection of said periscope;

said damping mass means comprising at least one damping mass for being disposed at said uppermost portion of said periscope;

said submarine having a superstructure for withdrawing said periscope thereinto;

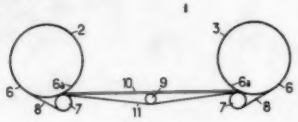
said submarine superstructure having an uppermost bearing for holding said lower portion of said periscope when extended; and

said damping apparatus, when withdrawn with said periscope into said submarine superstructure, fitting within said uppermost bearing.

4,640,217
PNEUMATIC BOATS

Michel Ferronniere, Paris, France, assignor to Zodiac, Issy les Moulineaux, France

Continuation of Ser. No. 399,299, Jul. 19, 1982, abandoned. This application Aug. 28, 1985, Ser. No. 769,810
Claims priority, application France, Jul. 22, 1981, 81 14294
Int. Cl.[4] B63B *7/08*
U.S. Cl. 114—345 16 Claims



1. An inflatable boat comprising two inflatable elongate legs drawing together at corresponding first ends thereof to form a bow portion of the boat, each leg comprised of a first part that is at least substantially parallel with the first part of the other leg and a second part which is connected with the corresponding second part of the other leg to form a part of said bow, each first part comprised of an upper compartment and of a lower compartment each said upper and lower compartments having at least a substantially circular cross section and fixed to the other compartment along a circumferential zone, said upper compartment having a cross section greater than the cross section of said lower compartment;

a rearwardly located transom connecting the other ends of said two legs together, said transom being adapted to receive a motor;

a lateral sheet fixed tangentially to said two upper and lower compartments on the outer sides of each leg; said upper and lower compartments of each leg being dimensioned and disposed with respect to each other so that the angle formed by said lateral sheet and the horizontal plane is between 5° and 45°;

a floor rigid in the transverse direction and engaging the lower face of said upper compartment;

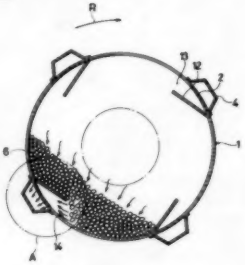
a bottom sheet fixed to said legs at the connection between the upper and lower compartments of said legs;

and a keel interposed between said floor and said bottom sheet, the diameters and size of said lower compartments being such that said bottom sheet contacts the water when said boat is floating.

4,640,218
TABLET COATING APPARATUS

Shimesu Motoyama, Asaka; Masakazu Gotou; Hiromu Shirakawa, both of Tokyo, and Takamoto Makino, Sakado, all of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,739
Claims priority, application Japan, Oct. 4, 1982, 57-174273
Int. Cl.[4] B05C *5/00, 19/00*
U.S. Cl. 118—19 18 Claims



1. An apparatus for applying a coating on tablets or the like

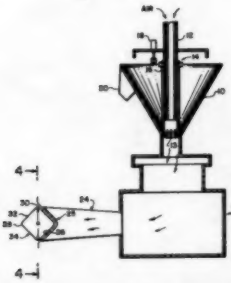
comprising a rotatable coating drum and at least one ventilating area provided in the wall of said drum, characterized in that an imperforate baffle means at least coextensive with the ventilating area for covering said ventilating area from inside of said drum is provided in said drum which does not permit tablets to fall on a wall portion extending below the baffle but which causes said tablets to fall onto said drum wall adjacent said ventilating area, the leading edge of said baffle means relative to the rotational direction of said drum is substantially in contact with the inner wall surface of said drum, and an unobstructed ventilating opening and an unobstructed path are defined between at least one of the trailing edge or side edges of said baffle means and the inner wall surface of said drum whereby tablets introduced in the drum fall from said baffle to said drum wall along said unobstructed path as said drum is rotated.

4,640,219

APPARATUS FOR COATING MATERIALS ONTO ELONGATED FOODSTUFFS

James E. Anderson, Madison, and Terry L. Holmes, Monona, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 5, 1985, Ser. No. 698,297
Int. Cl.[4] B05C *19/00*
U.S. Cl. 118—24 **18 Claims**



1. A coating material application apparatus for coating an elongated food product that comprises: means for conveying said food product at a predetermined rate past an applicator nozzle, said conveying means further comprising an area of non-support; an applicator nozzle for dispersement of coating material onto said food product, said applicator nozzle comprising a body structure having a vertical width substantially greater than the horizontal width, said vertical width being substantially equal to the diameter of a cylindrical food product or the diagonal width of a square or rectangular food product, a nozzle discharge, and an opening sufficient to evenly coat about one-half of said food product side surfaces and said nozzle discharge and having an ellipical, semi-circular, or angular configuration conforming to said food product side surfaces, said applicator nozzle positioned at said conveying means area of non-support; and a blower means for impelling coating material through said opening of said applicator nozzle.

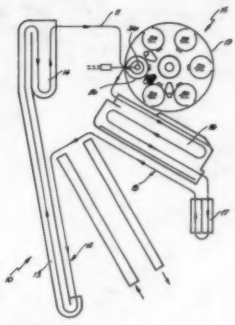
4,640,220

PAINT BOOTH ASSEMBLY

Spyros Fallas, Brighton Le Sands, Australia, assignor to Electropainting Sales Pty. Ltd., New South Wales, Australia

Filed Sep. 9, 1985, Ser. No. 774,054
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—326 **4 Claims**

1. A spray booth assembly having a vertically extending housing with a generally vertically extending peripheral surface defining a plurality of vertically extending spray chambers, said chambers being angularly spaced about a generally vertical axis, and means rotatably supporting said housing for



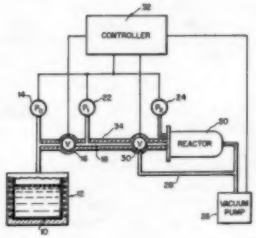
rotation about said axis, each of said chambers opening radially outwardly relative to said axis.

4,640,221

VACUUM DEPOSITION SYSTEM WITH IMPROVED MASS FLOW CONTROL

Steven G. Barbee, Dover Plains; Gregory P. Devine, Poughquag; William J. Patrick, Newburgh, and Gerard Seeley, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,729
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—689 **5 Claims**



1. A system for forming a layer of a material upon a surface from a gas comprising:

a reservoir for heating a material from which said gas is propagated;

a low pressure reactor wherein said layer is formed;

connecting means between said reservoir and said reactor;

means connected to the outlet of said reactor for creating a vacuum therein and causing said gas to flow from said reservoir through said connecting means to said reactor;

first pressure control means at the outlet of said reservoir for maintaining the pressure of said gas at the reservoir end of said connecting means at a first valve; and

second pressure control means at the inlet of said reactor maintaining the pressure of said gas thereat at a second value by adjusting said means for creating a vacuum, thereby providing a constant mass flow rate of said gas into said reactor.

4,640,222

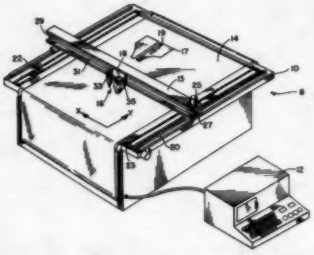
MARKING APPARATUS

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific Inc., South Windsor, Conn.

Continuation-in-part of Ser. No. 737,392, May 23, 1985, abandoned. This application May 31, 1985, Ser. No. 739,619

Int. Cl.[4] B05C *5/02*

U.S. Cl. 118—697 **26 Claims**



1. An apparatus for cutting and annotating porous sheet material, said apparatus comprising:

means defining a support surface for supporting said sheet material,

marking means for outputting a stream of powder downwardly onto said sheet material to mark it, said marking means comprising a movable mechanical element which engages said powder and urges it into air to minimize the force necessary to deliver said powder to said sheet material,

means for supporting said cutting means and said marking means adjacent to said support surface and for automatically moving said marking means and said support surface in relation to each other along a first course which outlines said annotation as said marking means outputs a stream of powder and moving said cutting means and said support surface in relation to each other along a second course which outlines a pattern piece as said cutting means cuts out said pattern piece, and

means for adjusting the output of said stream of powder in relation to a marking speed to regulate marking intensity.

4,640,223

CHEMICAL VAPOR DEPOSITION REACTOR

Alfred R. Dozier, 9075 Meadowrun Way, San Diego, Calif. 92129

Continuation-in-part of Ser. No. 634,146, Jul. 24, 1984, abandoned, which is a division of Ser. No. 306,697, Sep. 21, 1981, abandoned. This application Apr. 18, 1986, Ser. No. 853,690

Int. Cl.[4] C23C *13/08*

U.S. Cl. 118—719 **36 Claims**

1. Apparatus within which to conduct processes of silicon epitaxial chemical vapor deposition on substrate wafers, said apparatus comprising:

a heating enclosure comprising a heating enclosure wall which forms a heating chamber therein, said heating enclosure wall having a heating chamber opening therethrough and being insulated against loss of heat;

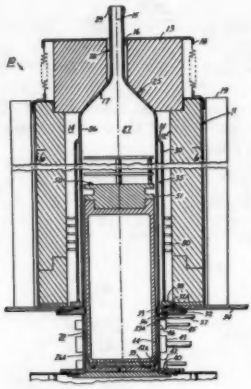
a reactor in said heating chamber, fitting in and closing said heating enclosure opening, said reactor including a heatable reaction chamber wall which is impermeable to gases and defines a reaction chamber and which makes a sealing fit in the opening in the heating chamber wall and itself has an opening through said reaction chamber wall which opens outside of said heating chamber, and reactant distribution means for receiving reactant and adapted to discharge reactant into said reaction chamber;

heater means in said heating chamber for heating said reaction chamber wall;

a wafer carrier so proportioned, arranged, and mounted as to be at least partially insertable into, and removable out of, said reaction chamber through said opening in said reaction chamber wall, said wafer carrier including support means to support said wafers spaced apart from one another so that at least one surface of each said wafer will be exposed in said reaction chamber;

closure means adapted to open and to close said opening in said reaction chamber to pass said wafer carrier and to seal said opening respectively;

reactant passage means entering said reactant distribution means, and being accessible from outside of said heating chamber for introducing reactants into said reactant distribution means, and thence into said reaction chamber;



a conditioning chamber aligned with said reaction chamber, said conditioning chamber including door means through which said wafer carrier can be placed in and removed from the interior of said conditioning chamber;

means for providing an atmosphere in said conditioning chamber which is not incompatible with the atmosphere which will exist in the reaction chamber when the wafer carrier is inserted into the reaction chamber; and

first moving means adapted to move said wafer carrier into and out of said reaction chamber, said wafer carrier being movable into and out of said conditioning chamber, whereby said wafer carrier can be moved into and out of said reaction chamber without direct communication of the reaction chamber with conditions external to the conditioning chamber.

4,640,224

CVD HEAT SOURCE

Matthew L. Bunch, Phoenix; J. B. Price, Scottsdale, and Robert W. Stitz, Mesa, all of Ariz., assignors to Spectrum CVD, Inc., Phoenix, Ariz.

Filed Aug. 5, 1985, Ser. No. 762,355

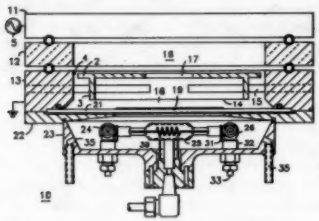
Int. Cl.[4] C23C *13/04*

U.S. Cl. 118—725 **4 Claims**

1. In a chemical vapor deposition apparatus having means for enclosing a volume, said means including a thermally translucent window, gas means for supplying gases to said volume and exhausting gases from said volume, and plasma means for causing a glow discharge within said volume, the improvement comprising:

heating means adjacent the outside of said window for di-

rectly heating an article upon which a deposit is to be formed within said volume;



wherein said heating means comprises a base, bracket means attached to said base, and at least one lamp resiliently attached to said base by said bracket means.

4,640,225

ODORLESS ANIMAL LITTER UNIT

Patrick Yananton, 1518 Little Hill Rd., Pt. Pleasant, N.J. 98762

Continuation-in-part of Ser. No. 315,307, Oct. 27, 1981, Pat. No. 4,469,046, which is a continuation-in-part of Ser. No. 909,256, May 24, 1978, abandoned. This application Jan. 26, 1984, Ser. No. 573,958

Int. Cl.⁴ A01K *29/00*

U.S. Cl. 119—1 **29 Claims**

1. In combination, a litter device for use with cats and sorbent pad laminate means for the collection of animal urine, said sorbent pad laminate means comprising:

(A) a bottom sheet layer of moisture impermeable material, overlying the base of of the device,

(B) an intermediate sorbent layer of material having a high sorption capacity for urine, and

(C) a top claw resistant screen means, said screen means being a urine permeable, flexible member of material which is substantially inert to urine,

formed of strands bonded at their intersections and having sufficient tear strength to withstand the clawing action of a cat and sufficiently small hole size to protect said sorbent layer and said sheet layer of moisture impermeable material from being torn by animal claws, said bottom

sheet layer and said top screen means being bonded to each other along at least a substantial portion of their periphery.

4,640,226

BIRD WATERING APPARATUS

Walter H. Liff, P.O. Box 96, Newcastle, N.H. 03854

Continuation-in-part of Ser. No. 662,365, Oct. 18, 1984. This application Oct. 23, 1985, Ser. No. 790,507

Int. Cl.⁴ A01K *45/00*

U.S. Cl. 119—1 **6 Claims**

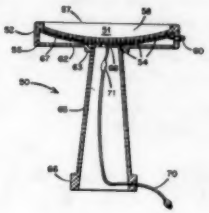
1. A temperature controlled birdbath device comprising:

(a) a molded plastic container having:

(1) an inner wall defining a closed bottom, sidewalls and an open top;

(2) an outer wall integrally joined to said inner wall at said top and extending below said closed bottom spaced outward of said inner wall to define an open bottom below said closed bottom;

(b) an electrical resistance heating element wound in contact with the bottom surface said inner wall consisting of negative temperature coefficient of conductivity heating cable; and,



(c) means to connect said heating element to a source of electrical energy, said heating element providing increasing electrical energy as the ambient temperature falls below the freezing temperature of water.

4,640,227

INTENSIVE SHRIMP BREEDING PROCESS

Jean-Paul Blancheton, Montpellier; Jacques Calvas, Noirmoutier; Alain H. Michel, Paris, all of France, and Vincent Vonau, Papeete-Tahiti, , assignors to Institut Francais de Recherche pour l'Exploitation de la Mer - IFREMER, Paris, France

Filed Dec. 19, 1985, Ser. No. 810,987

Claims priority, application France, Dec. 20, 1984, 84 19753

Int. Cl.⁴ A01K *61/00*

U.S. Cl. 119—2 **9 Claims**

1. A process for the intensive breeding of shrimps in tanks where only a small proportion of the water is renewed, with a view to obtaining the pre-growth or the growth of post-larvae more than twelve-days old, by feeding them with artificial food, process wherein before placing the post-larvae in the tank water, said water is prepared by topping up progressively the volume of water in the tank and adding daily to said water an artificial food containing nitrogenous organic products, then the water is stirred, oxidized, and its temperature is kept to between 15° C. and 33° C. until an important formation of flocs is obtained, said flocs being made up of heterotroph and nitrifying bacteria and phytoplankton and being kept in suspension in the water, after that post-larvae of shrimps are introduced into the tank containing said flocs and are fed with artificial food.

4,640,228

ANIMAL CAGE ASSEMBLY WITH REUSABLE FILTER CAP

Robert S. Sedlacek, Stoneham, Mass., and Neil Campbell, Hasbrook Heights, N.J., assignors to Lab Products, Inc., Maywood, N.J.

Continuation-in-part of Ser. No. 422,355, Sep. 23, 1982, Pat. No. 4,480,587. This application Sep. 24, 1984, Ser. No. 653,325

Int. Cl.⁴ A01K *1/03*

U.S. Cl. 119—15 **17 Claims**

1. A filter cap for an open-top animal cage, comprising:

a rigid body portion sized to fit upon and cover over the open top of said cage, said body portion having continuous, unbroken side and end walls, a perforated top wall and an open bottom end,

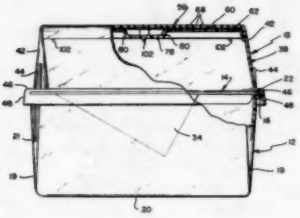
detachable air filter means extending across the entire perforated top wall of said filter cap body portion,

flange means extending around the periphery of the open bottom end of said body portion and including a lateral flange portion sized and positioned to rest upon the top surface of said animal cage when the filter cap is inserted thereon, to effect a substantial peripheral seal between said filter cap and said cage, and a continuous rigid skirt portion depending from said lateral flange portion and sized to closely encompass the open top of said cage such that

said filter cap overhangs said cage and cannot be dislodged therefrom,

said air filter means comprising a sheet of filter material sized to fit closely within the upper end of said body portion against said perforated top wall,

support means comprising a support member sized to fit closely within said filter cap and insertible through said open bottom end of said filter cap to a filter-retaining position in which it is flush against the under surface of said sheet of filter material with said sheet in a mounted



position in which it is sandwiched between said support means and the perforated top wall and covers over the perforations of said top wall, and

retaining means on the inner surfaces of at least some of said filter cap side and end walls for detachably securing said support member in said filter-retaining position,

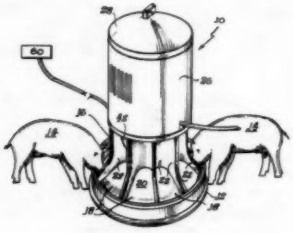
said retaining means being sized and positioned to engage the periphery of said support member with a snap fit when said support member is brought to its filter-retaining position.

4,640,229

APPARATUS FOR FEEDING LIVESTOCK

Ray E. Swartzendruber, Syracuse, and Keith Coffman, Leesburg, both of Ind., assignors to Chore-Time Equipment, Inc., Milford, Ind.

Filed Feb. 28, 1985, Ser. No. 706,492
Int. Cl.[4] A01K *5/02*
U.S. Cl. 119—51.11 **14 Claims**



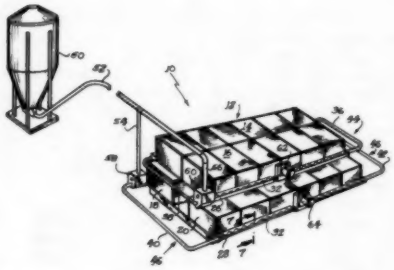
1. Apparatus for feeding livestock comprising: pan means accessible to the livestock for feeding therefrom; container means having a bottom and sides for holding a quantity of feed comprising dry powdered feed material; mixing means; feed dispensing means for dispensing measured increments of said feed to said mixing means; control valve means for dispensing measured increments of water to said mixing means; said mixing means being selectively operable for mixing said water with said feed to produce a fluid feed mixture; wherein said feed dispensing means comprises auger means and auger motor means operatively coupled for rotating said auger means; and further including an elongate recess extending below said bottom of said container means for mounting said auger means therein; said auger recess having an outlet at one end thereof and extending across said bottom of the container means to said outlet and being generally of semicylindrical cross-section and open-topped for mounting the auger recessed below but in communication with said container means for receiving feed therefrom and carrying said feed outwardly thereof; wherein said container is substantially circular in cross-section defining a generally circular bottom and generally cylindrical sidewall portion adjacent thereto and further including scraping means disposed for traversing a bottom portion of said container for agitating said feed and directing said feed generally into said elongate recess to be carried outwardly of said container by said auger; and wherein said scraping means comprises a generally cylindrical, open-topped recess extending below said container means bottom and in communication with at least a portion of said elongate recess, a sprocket member configured, and disposed in said circular recess, for rotation by said auger, and a resilient elongate member mounted for rotation with said sprocket member and extending radialy outwardly therefrom, and dimensioned for scraping a substantial portion of the interior bottom surface and an adjacent portion of an interior sidewall surface of said container means.

4,640,230

ROTATING HELICAL CONVEYOR SYSTEM

Gerardus H. Van Rooijen, Maldegem, Belgium, assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Dec. 9, 1985, Ser. No. 806,708
Int. Cl.[4] A01K *39/012*
U.S. Cl. 119—52 AF **7 Claims**

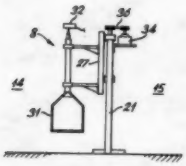


1. A conveyor system for delivering feed to a plurality of animal cages arranged in rows, said conveyor system comprising: an endless conduit extending along a conduit run past at least one of said rows of cages and through a feed trough disposed adjacent the faces of said row of cages; an elongate, continuous, endless material moving element extending through said endless conduit run and longitudinally movable therethrough, and driver means for advancing said endless material moving element through said conduit run; wherein said material moving element comprises an elongate helical member defining a longitudinal helix axis and bendable about said axis for following said endless conduit run, and wherein said driver means comprises a gear element having projecting teeth for engaging said helical emmber for axially advancing said helical member in response to rotation of said gear element; the interengaged surfaces of said gear element teeth and of said helical member being formed for rotating said helical member about the helix axis thereof simultaneously with said axial advancement thereof in response to rotation of said gear element.

4,640,231
ANIMAL SEPARATOR

Michael J. B. Turner, Clophill; Michael Hanley, Dunstable, and Eric S. Hartwell, Bedford, all of England, assignors to National Research Development Corporation, London, England

Filed May 28, 1985, Ser. No. 738,472
Claims priority, application United Kingdom, Jun. 1, 1984, 8413992
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—155 10 Claims

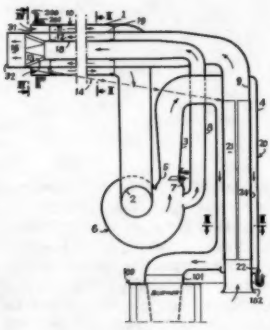


1. An apparatus for separating animals according to their weight or other chosen characteristic comprising: support means for allowing the animals to be examined one at a time, boundary means providing a barrier between a first collection region for animals selected as satisfying a particular chosen criterion and one or more second collection regions for the remaining animals, means mounting the support means for rotation about a vertical axis, drive means connected to and operative to rotate the support means by a predetermined amount to introduce or to allow the introduction of a selected animal into the appropriate collection region, and means connected to the drive means and responsive to a characteristic of an animal on the support means for operating the drive means.

4,640,232
DEVICE FOR EVACUATING INTO THE AMBIENT AIR COMBUSTION PRODUCTS FROM A CONDENSATION BOILER

Francois Couprie, Paris, France, assignor to Gaz de France, Paris, France

Filed Sep. 28, 1984, Ser. No. 655,575
Claims priority, application France, Sep. 30, 1983, 83 15657
Int. Cl.[4] F22D *1/00*; F22B *1/18*
U.S. Cl. 122—7 R 1 Claim



1. In a device for evacuating into the ambient air combustion products from a condensation boiler, in which at least one downstream section of the conduit for evacuating the combustion products is coaxial to the conduit for admission of the combustion air necessary for the burner of the boiler, and a fraction of the air collected in said admission conduit is returned towards the outside, the improvement which includes:

an opening for suction of the combustion air and for rejection of the combustion products into the ambient air;

means for returning a fraction of the collected air to the outside comprising a central tube coaxial to said downstream section of the conduit for evacuating the combustion products;

said conduit for admission of the combustion air surrounding said downstream section of the conduit for evacuating the combustion products;

said downstream section of the conduit for evacuating the combustion products, said coaxial section of the admission conduit and said means for returning to the outside a fraction of the collected air defining a first heat exchanger;

means for diluting the combustion products with said fraction of collected air located in the vicinity of said opening;

a second heat exchanger between said first heat exchanger and said boiler whereby the combustion products issuing from said boiler further heat the combustion air heated in said first heat exchanger;

said second heat exchanger being of the trickling water type to increase the humidity of the combustion air;

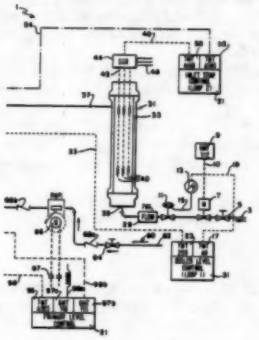
means associated with said first heat exchanger, adjacent the outlet of said conduit for evacuating the combustion prodcts, to collect the condensates formed in said conduit and return them into said second heat exchanger to constitute the trickling water; and

said second heat exchanger comprising an outer tube constituted by a part of said conduit conducting air to said boiler, and a coaxial inner tube constituted by a part of said conduit for evacuating the combustion gases, the outer face of said coaxial inner tube being covered with a porous, hygrophilic material allowing the condensation water to trickle, and said coaxial inner tube being made of a good heat-conducting metal and internally provided with longitudinal ribs.

4,640,233
MODEL STEAM GENERATOR

Robert Draper, Churchill Boro, and Edward H. Smith, Brave, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 31, 1984, Ser. No. 636,437
Int. Cl.[4] F22B *37/26*
U.S. Cl. 122—488 24 Claims



1. An improved model steam generator for simulating the conditions inside a full-scale steam generator in order to monitor the conditions of the heat exchange tubes and tubesheet contained within the full-scale generator, comprising a boiler vessel having a feedwater inlet for introducing feedwater to the interior of the vessel, at least one sample heat exchange tube for converting the feedwater into a flow of steam, a steam outlet for conducting the flow of steam out of the vessel, and

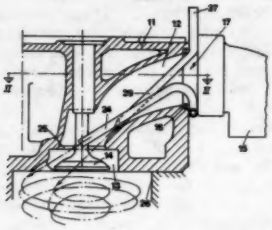
a separator assembly for separating water droplets entrained within the steam flowing out of the outlet to an extent greater than the amount of droplet separation achieved within the full-scale generator being monitored so that the model steam generator can be operated in a predictive mode, wherein said separator includes a plurality of stationary separator grids, each of which is formed from an array of deflector members.

4,640,234

METHOD OF RUNNING AN INTERNAL COMBUSTION ENGINE WITH ALTERNATIVE FUELS

John Olsson; Bertil Olsson, and Gunnar Olsson, all of Partille, Sweden, assignors to J-Jet Konstruktion HB, Partille, Sweden

Continuation-in-part of Ser. No. 513,118, Jun. 15, 1983, Pat. No. 4,548,187. This application Feb. 25, 1985, Ser. No. 704,928
Claims priority, application Sweden, Oct. 16, 1981, 8106113
Int. Cl.⁴ F02M *31/00*
U.S. Cl. 123—557 **16 Claims**



1. In a method of operating an internal combustion engine with one of a plurality of alternative fuels, the engine having at least one cylinder, an air intake and an inlet valve in an inlet port for the at least one cylinder, wherein the fuel is fed to the at least one cylinder through fuel feed lines and is preheated, and an additional medium is fed to the at least one cylinder, the improvement comprising:

detecting the flow of air drawn into the engine through the air intake;

proportioning and distributing the fuel to be fed to the at least one cylinder in response to at least said detected flow of air;

heating the fuel after said proportioning step to a temperature between the flame temperature and evaporation temperature of the fuel but below the auto ignition temperature of the fuel;

injecting the heated fuel through the inlet valve port at a substantially flat, tangential angle with respect to the wall of said at least one cylinder;

injecting the additional medium in a controlled amount into said at least one cylinder within the flow path of the fuel and at a steeper angle with respect to the cylinder wall than said fuel injection; and

operating the engine at the same compression ratio irrespective of the alternative fuel being used.

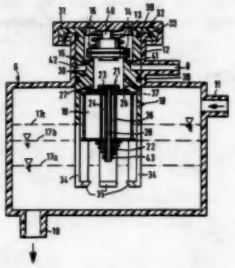
4,640,235

APPARATUS FOR CONTROLLING THE COOLANT MEDIUM CIRCULATION OF AN INTERNAL COMBUSTION ENGINE

Hans Martin, Stuttgart, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr., Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,102
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436702
Int. Cl.⁴ F01P *11/02*
U.S. Cl. 123—41.03 **20 Claims**

1. A device for protecting coolant circulation of an internal combustion engine from excess pressure including a first pressure control valve capable of selectively communicating a coolant-carrying tank with overflow means for removing coolant from the tank, comprising:



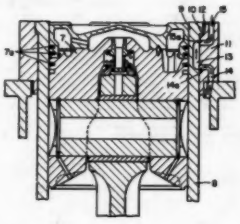
float means disposed in the tank upstream of said first pressure control valve for preventing a flow of coolant from the tank to the first pressure control valve and overflow means in response to a rising coolant level in the tank.

4,640,236

LIQUID-COOLED CYLINDER ASSEMBLY IN INTERNAL-COMBUSTION ENGINE

Hideaki Nakano, Akashi, and Tadahiro Ozu, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 25, 1985, Ser. No. 780,077
Int. Cl.⁴ F01P *3/02*
U.S. Cl. 123—41.79 **6 Claims**



1. An internal-combustion engine of the piston type having at least one cylinder assembly comprising a cylinder head and a cylinder liner capped at the upper end thereof by the cylinder head, the improvement comprising: a reinforcing ring fixedly fitted around the outer cylindrical surface of the upper end part of the cylinder liner; a plurality of recesses grooved in and at respective positions around said outer cylindrical surface; a plurality of passageways in the reinforcing ring and communicating with respective said recesses to form cooling-liquid passageways; said upper end part of the cylinder liner having an inverted frustoconical shape with the outer diameter thereof increasing gradually in the direction toward the cylinder head, and the inner wall surface of the reinforcing ring formed to fit tightly around said upper end part in a leak-proof manner for preventing relative displacements between the cylinder head, the cylinder liner, and the reinforcing ring.

4,640,237

FOUR STROKE PISTON ENGINE

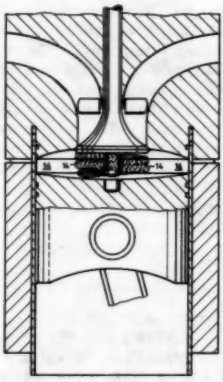
Josef Schaich, Oeschle 20, D-7906 Blaustein-Markbronn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 602,973, Apr. 23, 1984, abandoned, which is a division of Ser. No. 302,993, Sep. 17, 1981, Pat. No. 4,450,795, which is a continuation-in-part of Ser. No. 957,661, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 854,904, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 643,165, Dec. 22, 1975, abandoned. This application Aug. 22, 1985, Ser. No. 768,559

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529074

Int. Cl.[4] F01L *1/28;* F02B *3/00*

U.S. Cl. 123—79 C 4 Claims



1. A method of forming at least one combustible and rotating fuel-air mixture surrounded by a ring of air in a four-stroke internal combustion engine with cylinder, cylinder head, piston, gas inlet means, gas outlet means, ignition means and combustion space, characterized in that air with a substantially helically rotating flow pattern is introduced into the cylinder via inlet means disposed substantially coaxially with the longitudinal axis of the cylinder, that substantially turbulence-free and substantially helically rotating gas is compressed, that vaporized or gaseous fuel is blown into the helically rotating air substantially transversely to the axis of rotation by means of a fuel delivery device, fuel conducting means and at least one nozzle connected to said fuel conducting means and disposed in the region of the longitudinal axis of the cylinder in spaced relation to said inlet means in such a manner that the fuel jet terminates between said nozzle and the cylinder wall, the amount of fuel blown in being metered such that a combustible mixture zone is obtained which, in the compressed state, is enveloped by air.

4,640,238

OILTIGHT HYDRAULIC TAPPET FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE VALVE

Domenico Camosso; Franco Colanzi, both of Turin, and Silvio Ragazzoni, Pino Torinese, all of Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Italy

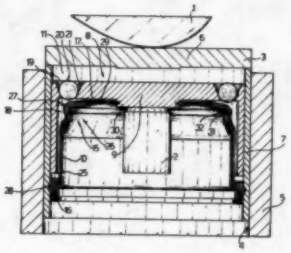
Filed Jul. 8, 1985, Ser. No. 752,949

Claims priority, application Italy, Jul. 16, 1984, 67715 A/84

Int. Cl.[4] F01L *991/24*

U.S. Cl. 123—90.55 5 Claims

1. A hydraulic tappet for controlling a valve of an internal combustion engine, the said tappet comprising a first cup member axially slidingly disposed in relation to the engine frame, and a second cup member axially slidingly disposed inside the said first cup member; each said cup member having a respective substantially flat bottom wall and a cylindrical side wall, said cup members cooperating to form a first variable-volume chamber with an inlet duct for activating fluid; the said duct being controlled by an on-off member in such a manner that the said fluid flowing into the said first chamber causes one of the said cup members to slide axially in relation to the other cup member so as to vary the volume of the said chamber; characterised by the fact that said tappet further comprises an annular member made of flexible material and arranged essentially inside the said second cup member in such a manner as to



form a second annular chamber for the said activating fluid, said second chamber connected hydraulically to the said first chamber via the said duct; the said annular member of flexible material having first and second annular edges connected in fluidtight manner respectively to the said side wall of the said first cup member and to the said bottom wall of the said second cup member and resilient means for urging said flexible annular member into a flexed position, whereby the volume of said second chamber is minimized, thereby causing activating fluid to flow from said second chamber to said first chamber.

4,640,239

DISTRIBUTOR FOR SPARK IGNITION INTERNAL COMBUSTION ENGINE

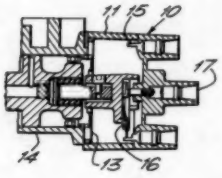
Robert Green, West Midlands, United Kingdom, assignor to Austin Rover Group Limited, Coventry, United Kingdom

Filed Mar. 25, 1985, Ser. No. 715,264

Claims priority, application United Kingdom, Mar. 28, 1984, 8408019

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—146.5 A 10 Claims



1. A distributor and camshaft combination for a spark ignition internal combustion engine, the rotor of the distributor connected to and driven by a spindle which is mounted in a resilient elastomeric bushing, the bushing mounted in a recess in an end of the camshaft, whereby the life of the rotor arm is extended.

4,640,240

ARRANGEMENT FOR LIMITING RADIAL THERMAL EXPANSIONS OF CYLINDERS OF A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

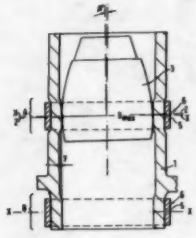
Gerhard Ziegler, Besigheim; Karl Gregotsch, Heimerdingen, and Rolf von Sivers, Rutesheim, all of Fed. Rep. of Germany, assignors to Dr. Ing.H.c.f. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,733

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335536

Int. Cl.[4] F02F *1/02*

U.S. Cl. 123—193 C 29 Claims



1. An arrangement for limiting radial thermal expansions of cylinders of a reciprocating piston internal combustion engine, comprising control means including at least one ring-shaped clamping member which is provided within an area of maximum alternating abutment pulses of a piston in the cylinder, each clamping member consisting of a material having a smaller coefficient of thermal expansion than the cylinder, and wherein the clamping member has such a position at the cylinder that its median center plane coincides approximately to at least one of an upper and lower dead-center position of the piston with a plane normal to piston movement, wherein the normal plane extends through a central region of a maximum piston diameter at said position of the piston.

4,640,241

FUEL INJECTION APPARATUS FOR DIESEL ENGINES

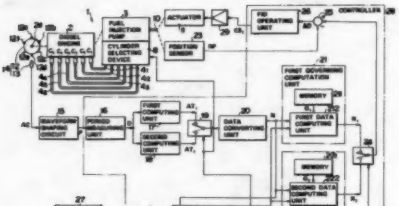
Masahiro Matsunaga, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed May 29, 1985, Ser. No. 738,944

Claims priority, application Japan, May 29, 1984, 59-107484; May 29, 1984, 59-107485

Int. Cl.[4] F03M *39/00*

U.S. Cl. 123—198 F 12 Claims



1. A fuel injection apparatus for a multi-cylinder diesel engine, comprising:

a fuel injection pump having a fuel regulating member;

a first means for producing at least one electric signal which represents an operating condition of the diesel engine;

a second means responsive to at least the electric signal for determining the cylinder of cylinders of the diesel engine to be used;

a control device which is responsive to the result of the determination in said second means and in accordance with the result of the determination in said second means controls the fuel supply so as to supply fuel to all of the cylinders in a non-skip-cylinder mode operation or to only selected cylinders in a skip-cylinder mode operation; and

a third means responsive to at least the electric signal for regulating the amount of fuel injected said fuel injection pump on the basis of a governor characteristic determined in accordance with the result of the determination in said second means,

wherein said third means has:

a memory for storing at least first characteristic data representing a governor characteristic for non-skip-cylinder operation of the diesel engine and second characteristic data representing a governor characteristic for skip-cylinder operation of the diesel engine;

a data generating means responsive to the electric signal for generating a target signal representing a target position of the fuel regulating member necessary for obtaining the optimum amount of fuel injection corresponding to the operating condition of the diesel engine at each instant on the basis of the data read out from said memory in accordance with the result of the determination in said second means; and

a servo means responsive to the target signal for controlling the position of the fuel regulating member so as to position the fuel regulating member at the position indicated by the target signal.

4,640,242

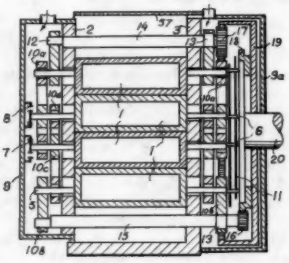
ROTARY ENGINE

Usher Meyman, 230 Ocean Pkwy., Brooklyn, N.Y. 11218

Filed Aug. 21, 1984, Ser. No. 642,871

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—246 6 Claims



1. A rotary engine comprising:

two covers spaced from one another;

a plurality of rotors located between said covers and rotating and planetating in different phases; said rotors interengaging to form working chambers therebetween; means to supply fluid to the working chambers and means to exhaust fluid from the working chambers during the operating cycle of the engine; gearing for synchronizing rotation and planetation of said rotors and each including first and second gears arranged so that one of said gears is connected with said rotors while the other of said gears is connected with an immovable part of the engine and said gears engage with one another;

a plurality of carriers interconnecting the rotors and planetating in the same phase with the planetation of the rotors for synchronizing the rotation and planetation of the rotors;

shafts arranged to support said carriers during their planeta-

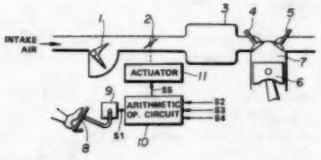
tions; and elements for connecting said covers with one another.

4,640,243

SYSTEM AND METHOD FOR CONTROLLING INTAKE AIR FLOW FOR AN INTERNAL COMBUSTION ENGINE

Toshimi Abo, Yokohama, and Yoshitaka Hata, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 22, 1985, Ser. No. 704,268
Claims priority, application Japan, Feb. 24, 1984, 59-32665
Int. Cl.[4] F02D 9/00
U.S. Cl. 123—399 14 Claims



1. A system for a vehicular internal combustion engine, comprising:

(a) first means for monitoring at least one engine operating variable;

(b) second means for detecting a gear position of an engine power transmission mechanism; and

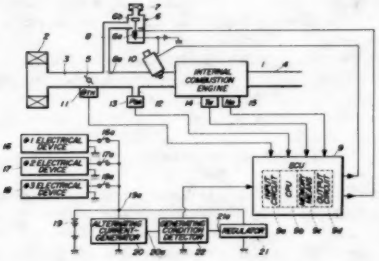
(c) third means for variably controlling the rate of change of negative pressure in an intake manifold of the engine in response to changes in desired intake air flow in accordance with at least one of the engine operating variable monitored by said first means and the gear position of the engine power transmission mechanism detected by said second means such that the rate of change of negative pressure is faster when the gear is placed in at least one of a high geared position and a neutral position than at a low geared position.

4,640,244

IDLING SPEED FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yuzuru Koike; Akihiko Koike, both of Utsunomiya, and Masayuki Ueno, Haga, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,559
Claims priority, application Japan, Sep. 28, 1984, 59-201589
Int. Cl.[4] F02D 41/16; F02M 3/07
U.S. Cl. 123—339 7 Claims



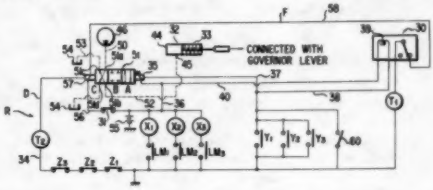
1. A method of controlling the operating amount of a control valve for regulating the quantity of intake air being supplied to an internal combustion engine, in a feedback manner responsive to the difference between a desired idling speed and an actual engine speed while said engine is in a predetermined idling region, said engine having a generator driven for supplying electric power to at least one electrical device in dependence upon the operative states of said electrical device, the method comprising the steps of: (1) detecting the value of a signal indicative of generating conditions of said generator; (2) determining a correction value for the operating amount of said control valve in dependence upon the value of said signal thus detected; (3) correcting the operating amount of said control valve by means of said correction value thus determined; and (4) setting an initial value of the operating amount of said control valve which is applied at the start of the feedback control to a sum of a value obtained by correcting said correction value by a predetermined increment, and a predetermined reference value, when said engine has entered said predetermined idling region immediately after deceleration thereof.

4,640,245

METHOD OF CONTROLLING AN ENGINE MOUNTED ON A CONSTRUCTION VEHICLE

Yukinobu Matsuda, Komatsu, and Takayasu Inui, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,332
Claims priority, application Japan, May 31, 1984, 59-109378
Int. Cl.[4] F02D 41/00
U.S. Cl. 123—339 4 Claims



1. The method of controlling an engine mounted on a construction vehicle used for earth moving operations and including operating levers associated with control valves for work implements and a control system, said operating levers having operating positions and neutral positions, said method comprising the steps of:

reducing the rotational speed of the engine to a primary number of revolutions per minute immediately after all said operating levers associated with all control valves for work implements and the control system are shifted to their respective neutral positions;

maintaining the engine under such a low speed running condition for a predetermined period of time; and

then reducing further the rotational speed of the engine to a lower, secondary number of revolutions per minute.

4,640,246

ROAD AND ENGINE SPEED GOVERNOR WITH POWER DEMAND CONTROL

H. David Sturdy, Wilmington, N.C., assignor to Sturdy Truck Equipment, Incorporated, Wilmington, N.C.

Filed Jan. 3, 1986, Ser. No. 815,966
Int. Cl.[4] F02D 41/00, 43/00
U.S. Cl. 123—350 2 Claims

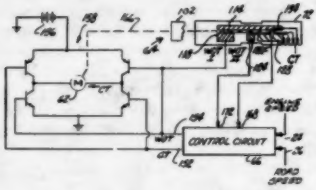
1. A speed limiting governor for use with an engine having a throttle movable between an open throttle position and a close throttle position for regulating the flow of fuel to the engine, said governor being of the type comprising an overriding throttle closing means,

an engine speed signal generating means for producing a signal corresponding to engine speed,

a load speed signal generating means for producing a signal corresponding to load speed,

actuating means including a reversible motor coupled with the overriding throttle closing means and being responsive to motor control signals for energizing the motor in the close throttle direction or in the open throttle direction,

logic means responsive to the engine speed signal and the load speed signal for producing motor control signals for



moving the overriding means between a wide open throttle position and a close throttle position and to intermediate positions including a reference position, said logic means being responsive to said speed signals for moving said overriding means in the close throttle direction to said reference position when the engine speed reaches a first preset value,

and means responsive to engine power demand for energizing said motor to move said overriding means from said reference position toward said open throttle position.

4,640,247

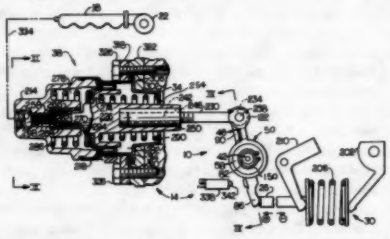
AIR-FUEL RATIO CONTROL SYSTEM HAVING A FLUID-POWERED BROKEN-LINK MECHANISM

E. Eugene Bruning, Normal, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 698,205, Feb. 4, 1985, abandoned. This application Jul. 1, 1985, Ser. No. 750,836

Int. Cl.[4] F02D 1/06

U.S. Cl. 123—388 **28 Claims**



1. A fluid-powered broken-link mechanism for an internal combustion engine, said engine having a housing, a source of fluid which is adapted to be pressurized only during engine operation, a fuel quantity control member movable in both a fuel-increasing direction to increase the quantity of fuel supplied to the engine during each combustion cycle and in a fuel-decreasing direction to decrease the quantity of fuel supplied to the engine during each combustion cycle, a governor controlling the position of the fuel quantity control member, and an override means for selectively overriding the governor during engine operation to prevent movement of the fuel quantity control member in the fuel-increasing direction when the ratio of air-to-fuel supplied to the engine for combustion falls below a preselected value, said fluid-powered broken-link mechanism adapted to be operatively linked between the override means and the fuel quantity control member and comprising:

a first lever having a shaft portion adapted to be rotatively mounted within the housing and an arm adapted to swing into contact with the fuel quantity control member;

a second lever adapted to be pivotally connected to said override means and being rotatively mounted on the shaft portion and also being axially movable thereon between a disengaged axial position at which the second lever is completely free of drivable engagement with the first lever and an engaged axial position at which the second lever drivably engages the first lever in one angular direction;

axial biasing means for axially biasing the second lever towards the disengaged axial position;

angular motive means for rotating the first lever relative to the second lever so that the axially engageable portions of the levers are substantially angularly aligned to facilitate drivable engagement;

fluid power means for moving the second lever to the engaged axial position against the bias of the axial biasing means when pressurized fluid is communicated thereto; and

valve means for selectively blocking fluid communication between the source of fluid and the fluid power means when the first lever is rotated to a first predetermined angular position and for selectively opening fluid communication between the source of fluid and the fluid power means to axially move the second lever under pressurized fluid power to the engaged axial position when the first lever is rotated to a second predetermined angular position.

4,640,248

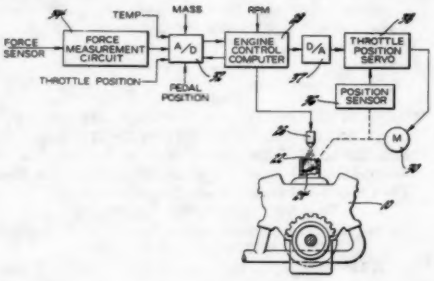
FAILSAFE DRIVE-BY-WIRE ENGINE CONTROLLER

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1985, Ser. No. 812,901

Int. Cl.[4] F02D 11/10, 41/22

U.S. Cl. 423—399 **2 Claims**



1. A control system for a vehicle internal combustion engine having an intake space into which air and fuel are supplied, comprising in combination:

an accelerator pedal biased to an engine idle position and operable to an engine off-idle position in response to a force applied thereto;

position sensing means for sensing the position of the accelerator pedal;

force sensing means for sensing the force applied to the accelerator pedal; and

means responsive to the force applied to the accelerator pedal sensed by the force sensing means for supplying an air and fuel mixture to the engine in accord with the accelerator pedal position sensed by the position sensing means when the force applied to the accelerator pedal is greater than zero and in accord with an engine idle schedule when the force applied to the accelerator pedal is zero, whereby the engine operation is maintained at idle when the force applied to the accelerator pedal is zero even

though the accelerator pedal position remains in an off-idle position.

4,640,249

SYSTEM FOR CONTROLLING AN IGNITION TIMING IN AN INTERNAL COMBUSTION ENGINE AND METHOD THEREFOR

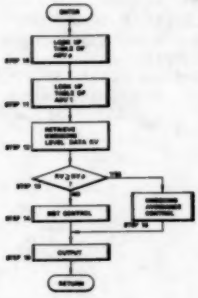
Yoshihisa Kawamura, and Shuzo Fukuzumi, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 27, 1985, Ser. No. 749,413

Claims priority, application Japan, Jun. 30, 1984, 59-136708; Jun. 30, 1984, 59-136709

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—425 **10 Claims**



1. A system for controlling an ignition timing of an internal combustion engine, comprising:

(a) first means for detecting an engine operation condition;

(b) second means for detecting whether the engine is in a transient operating state on the basis of the detected engine operating condition;

(c) third means for detecting engine knocking;

(d) fourth means for detecting an engine rotational angle with respect to a top dead center position in a compression stroke of an engine cylinder at which pressure in a combustion chamber has reached its maximum;

(e) fifth means responsive to said first, second, third and fourth means for determining that engine knocking is not occurring, that the engine is warmed up, and that the detected rotational angle falls in a range from a first to a second reference value when a predetermined time has elapsed in which the engine has operated in a non-transient condition, and, responsive to said determination, storing a correction value of the ignition timing as a learning value in an address corresponding to the detected engine operating condition, said learning value being based on said detected rotational angle and said first and second reference values being values of engine rotational angle which are set for enhancing the stability of a minimum advance for best torque control and deviate from a predetermined maximum engine output torque value by a predetermined percentage toward retardation and advance angles, respectively, to stabilize the engine rotational angle at which the combustion chamber pressure is a maximum; and

(f) sixth means for calculating the ignition timing on the basis of a basic ignition timing value determined according to the detected engine operating condition and the learning value corresponding to the detected engine operating condition.

4,640,250

METHOD AND APPARATUS FOR ENGINE KNOCK LEVEL CONTROL

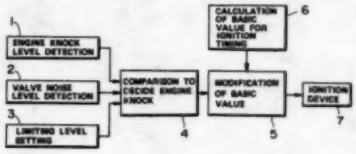
Akio Hosaka, and Akito Yamamoto, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 6, 1985, Ser. No. 698,916

Claims priority, application Japan, Feb. 7, 1984, 59-19362

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—425 **21 Claims**



1. A method of controlling the level of knock in an internal combustion engine having knock induced vibrations and valve noises, comprising the steps of:

calculating a basic value for the timing of ignition of said engine based upon engine operating parameters;

generating a vibration indicative signal in response to knock induced vibrations and valve noises;

generating a first and second signal in response to said vibration indicative signal, said first signal having a value corresponding to the level of the knock induced vibrations, said second signal having a value corresponding to the level of the valve noises;

generating a third signal having a value corresponding to a limiting level;

deciding the occurrence of engine knock when said first signal exceeds at least one of said second and third signals; and

modifying said basic value based upon the decision of the occurrence of engine knock.

4,640,251

METHOD OF DISCRIMINATING OCTANE NUMBER OF FUEL FOR MOTOR VEHICLE

Osamu Harada; Toshio Suematsu; Yuji Takeda, and Katsushi Anzai, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 12, 1985, Ser. No. 775,431

Claims priority, application Japan, Oct. 1, 1984, 59-206031

Int. Cl.[4] G01N *33/22*; F02D *43/00*

U.S. Cl. 123—425 **10 Claims**

1. A method of discriminating an octane number of a fuel for motor vehicle having an electronic ignition timing system wherein a basic ignition advance angle is determined in accordance with an engine operational condition so that the ignition timing is optimum for a predetermined octane number and is corrected so as to be retarded by using a correction value for retardation of the ignition timing when a knocking greater than a first predetermined level is detected, comprising the steps of:

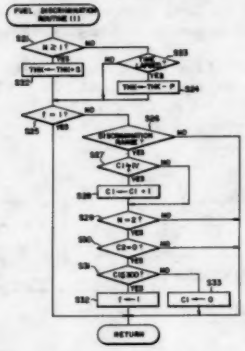
determining as to whether the correction value is a predetermined discriminating value in vicinity of the maximum value thereof;

detecting a rapid acceleration of the engine;

comparing a frequency of occurrence of the knocking greater than a second predetermined level with a reference frequency; and

discriminating the fuel as to whether the octane number thereof is the predetermined octane number or not in accordance with the frequency of occurrence of knocking greater than the second predetermined level when it is determined that said correction value is equal to said predetermined discriminating value in said determining

step and no rapid acceleration is detected in said detecting step; and



wherein when said rapid acceleration is detected, said discriminating step is skipped over.

4,640,252

FUEL INJECTION SYSTEM FOR DIESEL ENGINE

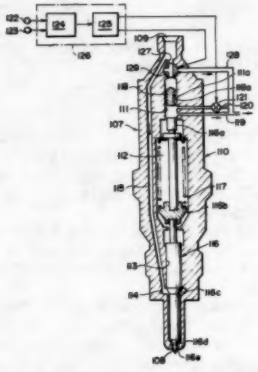
Saburo Nakamura; Tsutomu Matsuoka; Hirofumi Yamauchi, and Masanori Sahara, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 25, 1985, Ser. No. 694,960

Claims priority, application Japan, Jan. 28, 1984, 59-14130; Feb. 1, 1984, 59-17874; Feb. 1, 1984, 59-17875; Feb. 8, 1984, 59-22446

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—446 **18 Claims**



1. In a fuel injection system for a diesel engine comprising a pintle type fuel injection nozzle and fuel supply means for feeding pressurized fuel to the fuel injection nozzle, the fuel injection nozzle having a valve needle slidable back and forth in the axial direction thereof between a valve closure position in which a front end portion thereof is inserted into a spray hole and a maximum lift position in which the distance between the front end portion and the spray hole is maximum, and a central plunger member which is slidable in the axial direction of the valve needle and provided with a front end face, opposed to a rear end face of the valve needle, and a rear end face adapted to receive the pressure of the pressurized fuel fed to the fuel injection nozzle from the fuel supply means, the valve needle being adapted to be lifted by a predetermined fuel pressure to a pre-lift position where the rear end face of the valve needle abuts against the front end face of the plunger member so that further lift of the valve needle is resisted by the fuel pressure acting on the rear end face of the plunger member, thereby changing the valve opening pressure stepwise with change in the amount of lift of the valve needle,

the improvement which comprises pre-lift change means for changing the amount of the pre-lift of the valve needle and including a plurality of fuel drain passages provided in a wall of a cylindrical space formed in a valve body and being spaced from each other in the direction of movement of the valve needle, said valve needle and said central plunger member being slidably received in a cylindrical space formed in a valve body, and switching valve means for selectively opening and closing the fuel drain passage under the control of the control means, each fuel drain passage being adapted to discharge leakage fuel between the valve needle and said central plunger member.

4,640,253

ELECTRONIC FUEL INJECTION CONTROL WITH VARIABLE INJECTION TIMING

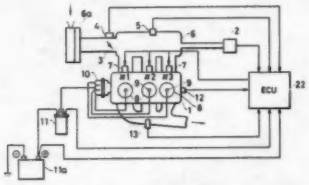
Kenichiro Kamai, Toyoake, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 26, 1985, Ser. No. 749,090

Claims priority, application Japan, Jun. 26, 1984, 59-131274

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—475 **10 Claims**



1. A method for controlling fuel injection into an internal combustion engine having an odd number of cylinders using an electronic fuel injection control system, comprising the steps of:

(a) monitoring operating conditions of said engine;

(b) measuring the variation of engine speed in accordance with ignition signals from an ignition unit of said engine;

(c) supplying fuel injectors provided for said engine with the first injection pulse signal in response to the first ignition signal in each engine cycle;

(d) deriving an additional period of time from ignition signals;

(e) trimming said additional period of time to be lengthened when the engine speed is decreasing and to be shortened when the engine speed is increasing; and

(f) supplying said fuel injector with the second injection pulse signal after the elapse of the trimmed additional period of time from the generation of the $(m+1)/2^{th}$ ignition signal in each engine cycle where m represents the number of cylinders of said engine.

4,640,254

AIR-FUEL RATIO CONTROL SYSTEM

Masakazu Ninomiya, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 4, 1985, Ser. No. 772,407

Claims priority, application Japan, Sep. 5, 1984, 59-186798

Int. Cl.[4] F02M *51/00, 7/06*

U.S. Cl. 123—492 **23 Claims**

1. An apparatus for controlling an air-fuel ratio of a mixture to be supplied to an engine, comprising:

means for sensing at least one operating parameter of said engine;

means for storing a predetermined relationship between at least one operating parameter of said engine and a plural-

ity of air-fuel ratios leaner than a stoichiometric air-fuel ratio;

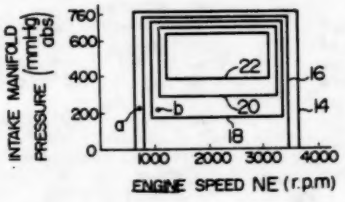
first memory means for storing a target air-fuel ratio; and

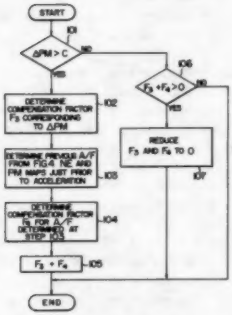
control means for:

(A) determining if an acceleration of said engine is greater than a predetermined threshold,

(B) during a steady-state operation, where an acceleration of the engine is less than said predetermined threshold:

(1) selecting a target air-fuel ratio one of said plurality of air-fuel ratios from said storing means, said selecting being accomplished as a function of at least one of said





at least one operating parameter during each engine cycle of a definite length, and

(2) storing said target air-fuel ratio in said first memory means during each said engine cycle, and

(C) during an acceleration operation where said acceleration of the engine is greater than said predetermined threshold:

(1) reading said selected target air-fuel ratio from said first memory means, this read target air-fuel ratio indicating an air-fuel ratio existing before said acceleration operation, and

(2) varying an amount of fuel supplied to said engine based on said read target air-fuel ratio.

4,640,255

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Walter Häfele, Felbach; Manfred Krämer, Schwieberdingen; Dietmar Schmieder, Markgröningen, and Johann Warga, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

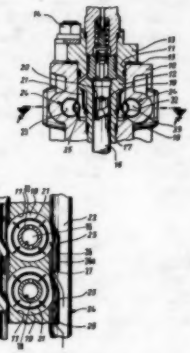
Filed May 6, 1985, Ser. No. 730,616

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417036; Mar. 16, 1985, 3509536

Int. Cl.⁴ F02M *59/00*

U.S. Cl. 123—495 **17 Claims**

1. A fuel injection pump for internal combustion engines, comprising a plurality of pump cylinders disposed in line in reception bores of a pump housing, each of said pump cylinders arranged to receive a pump piston provided with control edges to determine the duration of injection, said pump cylinders further being surrounded by partial suction chambers and arranged to communicate with said partial suction chambers by means of overflow openings, inflow and outflow conduits disposed parallel to a camshaft of said engine for fuel flow into and out of said partial suction chambers, quantity dividers



positioned in said inflow conduits and said outflow conduits for fuel flow and said quantity dividers adapted to allocate to each said partial suction chamber a separate partial flow of fuel.

4,640,256

INTERNAL COMBUSTION ENGINE EXHAUST GAS RECYCLING ARRANGEMENT

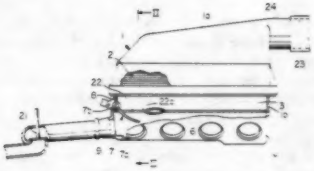
Ulrich Conrad, Ludwigsburg; Peter Moser, Weinstadt, and Gerhard Gruber, Backnang, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,666

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324343

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—568 **11 Claims**



1. An air guide casing for use on a multicylinder fuel injection internal combustion engine equipped with

an exhaust pipe,

an exhaust gas recycling pipe for conducting recycled exhaust gas, the recycling pipe being connected to the exhaust pipe,

an air filter for treating air combustion,

a clean air chamber for conducting treated air for combustion,

an air throttle valve for throttling treated air being conducted by the clean air chamber,

the recycling pipe being in fluid comunication with a mixing duct positioned downstream of the air throttle valve by operation of an exhaust gas recycling valve to permit recycled exhaust gas to be conducted from the exhaust pipe into the mixing duct via the recycling pipe to cause the recycled exhaust gas to be mixed with a quantity of

treated air for combustion being conducted therethrough, the air guide casing comprising:

a distribution duct for conducting the mixture of recycled exhaust gas and treated air for combustion,

a partition situated within the air guide casing to divide the air guide casing into a first portion including the clean air chamber and a second portion including the mixing duct and the distribution duct, the distribution duct being coupled to the mixing duct and in communication with at least one cylinder in the internal combustion engine,

means for mounting the air throttle valve on the partition,

wherein the partition includes a shaped lip portion in proximity to an opening between the clean air chamber and the mixing duct, the shaped lip portion having a drop-like shape when viewed in cross section to improve air flow through opening.

4,640,257

ENGINE CONTROL WITH EXHAUST GAS RECIRCULATION

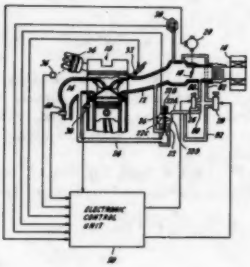
Katsuhiko Kodama, Oobu, and Hisamitsu Yamazoe, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 30, 1985, Ser. No. 729,145

Claims priority, application Japan, May 1, 1984, 59-88644; May 8, 1984, 59-91424

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **12 Claims**



1. Apparatus for controlling the amount of exhaust gases to be recirculated from an exhaust passage of an internal combustion engine to an intake passage of the same, comprising:

(a) means for detecting various engine parameters;

(b) gas sensor means for detecting the concentration of an exhaust gas in said exhaust passage;

(c) means for forcibly interrupting exhaust gas recirculation when said engine is under air/fuel ratio feedback control and exhaust gas recirculation is being performed; and

(d) computing means for computing a value representing a desired amount of exhaust to be recirculated using engine parameters and for:

(1) producing a correction factor using an output signal from said gas sensor means;

(2) obtaining a first mean value of a first plurality of feedback correction factor values during feedback control of air/fuel ratio and during exhaust gas recirculation control;

(3) interrupting exhaust gas recirculation during air/fuel ratio feedback control;

(4) obtaining a second mean value of a second plurality of feedback correction factor values when exhaust gas recirculation is being interrupted;

(5) resuming exhaust gas recirculation when said second mean value is obtained;

(6) detecting a difference between said first mean value and said second mean value; and

(7) correcting said value using said difference.

9. Apparatus for controlling air-fuel mixture to be supplied to an internal combustion engine having an intake passage, an exhaust passage, and an exhaust gas recirculation passage for recirculating exhaust gases in said exhaust passage to said intake passage therethrough, said apparatus comprising:

(a) means for detecting intake and rotational conditions of said engine;

(b) means for controlling an amount of fuel to be supplied to said engine with air for combustion therein in accordance with said detected intake and rotational conditions;

(c) means for detecting an exhaust composition of said exhaust gas in said exhaust passage;

(d) means for determining a correction factor which is determined from detected exhaust composition when said engine is under a predetermined feedback control;

(e) means for correcting said amount of fuel using said correction factor;

(f) means for controlling an amount of exhaust to be recirculated through said recirculation passage in accordance with said detected intake and rotational conditions;

(g) first averaging means for obtaining a first mean value of a first plurality of said correction factor values during feedback control of air/fuel ratio and during exhaust gas recirculation control;

(h) means for prohibiting exhaust gas recirculation during air/fuel ratio feedback control;

(i) second averaging means for obtaining a second mean value of a second plurality of said correction factor values when exhaust gas recirculation is being prohibited;

(j) means for resuming exhaust gas recirculation when said mean value of said second feedback correction factor values is obtained;

(k) means for determining a difference between said mean value of said first feedback correction factor values and said means value of said second feedback correction factor values; and

(l) means for correcting said air-fuel mixture in accordance with said detected difference between said first and second correction factor values.

4,640,258

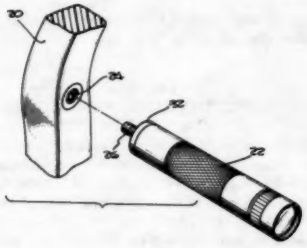
ARCHERY SHOOTING BOW WITH STABILIZING FLASHLIGHT

C. Bradford Penney, Norristown, and Raymond L. Sharrah, Collegeville, both of Pa., assignors to Streamlight, Inc., Norristown, Pa.

Filed Nov. 1, 1984, Ser. No. 667,209

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—24 R **2 Claims**



1. A shooting bow assembly comprising:

a bow having an elongated frame with a rigid central portion and bendable end portions, a string mechanism intercoupling the extremities of said end portions, a hand grip formed on said rigid central portion of said frame, an arrow guide carried by said frame adjacent the upper end of said hand grip, and a tapped threaded bore in said rigid central portion of said frame adjacent the lower end of

said hand grip, said bore facing away from said string mechanism;

a flashlight having an elongated metal housing and a metal tail cap on the rearward end of said housing, said tail cap having a protruding threaded stud which is threadedly secured within said threaded bore;

said flashlight having switch means that may be manually actuated while said flashlight is fixedly supported from said threaded bore; and

said flashlight acting as a stabilizer for said bow and concurrently providing illumination in the general direction in which an arrow may be shot from said bow.

4,640,259

DEVICE FOR FEEDING WORK TO MACHINE TOOL

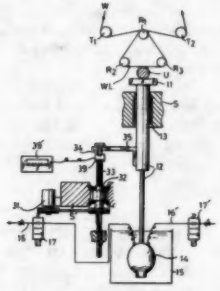
Hiroshi Shimizu, Tokyo, Japan, assignor to Yasunaga Engineering Kabushiki Kaisha, Ueno, Japan

Filed Apr. 5, 1985, Ser. No. 720,238

Claims priority, application Japan, Jan. 21, 1985, 60-7568

Int. Cl.[4] B28D *1/06*

U.S. Cl. 125—16 R **4 Claims**



1. A device for feeding a work to a tool comprising:

a machine frame;

a slidable member slidably connected to the machine frame so that the slidable member can be moved vertically, said slidable member having an upper end adapted to support the work thereon and a lower end;

means for moving the slidable member upwardly, said moving means including a container having liquid therein, an air float connected to the lower end of the slidable member, said air float being substantially completely submerged in the liquid in the container so that the slidable member can be moved upwardly by means of buoyancy of the air float, and means for controlling buoyancy of the air float so that speed of movement of the slidable member in the vertical direction can be controlled, and

means for comparing the speed of the vertical movement of the slidable member and a desired speed, said comparing means operating the controlling means to change buoyancy of the air float so that the work on the table can be moved at desired speed.

4,640,260

ADJUSTABLE FLEXIBLE DUAL GAS MIXING ASSEMBLY

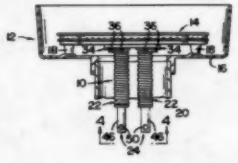
Manuel Perez, 11204 Hidden Valley, Tampa, Fla. 33624

Filed Jan. 22, 1986, Ser. No. 821,046

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—39 E **6 Claims**

1. An adjustable gas mixing assembly specifically configured for use with a burner gas grill including a burner element having a first and second gas supply port formed therein, said adjustable gas mixing assembly comprising a flexible gas supply tube secured to the burner element in open fluid communication with the first or second gas supply port and a corresponding rigid mixing tube rotatably disposed within said flexible gas supply tube, said flexible gas supply tube including a mounting member including a substantially rectangular flat mounting plate having a first pair of mounting apertures formed thereon and an offset gas outlet port in open fluid communication with the interior of said flexible gas supply tube and said lower rigid mixing tube mounting member configured to secure said flexible gas supply tube to the burner element, said rigid mixing tube including an annular flange



formed on the inner end thereof and at least one air aperture and a gas inlet port formed on the outer portion thereof such that said flexible gas supply tube may be deflected laterally and said rigid mixing tube may by adjusted longitudinally relative to said flexible gas supply tube, the first and second gas supply ports being offset relative to each other with respect to the lateral center line of the burner element such that said substantially rectangular flat mounting plate will close the first gas supply port when in a first position and the second gas supply port when in a second position.

4,640,261

CERAMIC BURNER PLATE FOR GAS COMBUSTION

Hiroyuki Kato, and Toshifumi Yamana, both of Aichi, Japan, assignors to Rinnai Kabushiki Kaisha, Nagoya, Japan

Filed Jan. 29, 1985, Ser. No. 696,071

Claims priority, application Japan, Jan. 30, 1984, 59-13377

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—39 J **5 Claims**

1. In a ceramic burner plate for gas combustion which is provided with a large number of flame openings passing therethrough between its front and rear surfaces and which is formed by molding a particulate composition into a plate shaped member and baking same, the improvement consisting of a particulate composition comprising about 33–40 weight percent of a clay, about 3–8 weight percent of talc, about 25–40 weight percent of a pore-producing substance, and about 14–36 weight percent of mullite.

4,640,262

HEATER, ESPECIALLY A HEATER FOR VEHICLES

Werner Lucius, Starnberg, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Aug. 22, 1984, Ser. No. 643,305

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337601

Int. Cl.[4] F24H *3/02*

U.S. Cl. 126—110 B **19 Claims**

1. A heater, especially for a fuel operated vehicle heater, of the type having a fuel enrichment unit, an ignition device, a burner comprised of a nozzle and a vorticization element, and a combustion chamber defined by a combustion pipe from which exhaust gases are guided to an exhaust outlet in a reverse flow along an outer wall of the combustion pipe in heat exchange relationship to a heating medium, wherein a cylindrical insert is provided as a means for supporting the flame by concentration thereof in the combustion pipe, said insert being connected to the burner in a manner forming an annular space extending along the full length of the insert between an outer circumferential surface of the cylindrical insert and an inner

surface of a circumferential wall of the combustion pipe by being arranged concentrically in the combustion pipe and projecting into the combustion chamber defined by the combustion pipe from the area of the vorticization element.

4,640,263

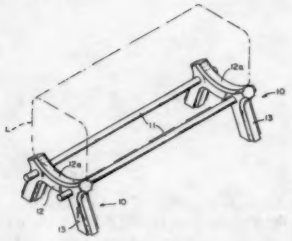
GRATE FOR ARTIFICIAL LOG

Gerald C. Nelson, P.O. Box 80816, Seattle, Wash. 98108

Filed Apr. 4, 1985, Ser. No. 720,031

Int. Cl.[4] F23H *13/00*

U.S. Cl. 126—164 **2 Claims**



1. An adjustable grate for use with an artificial log, comprising:

a pair of identical upright end supports of unitary one-piece construction, each having an upper horizontal saddle portion presenting an upper concave support surface for receiving an end portion of the log and each having a pair of support legs of equal length depending from the saddle portion;

a pair of matching horizontal parallel rods of uniform cross-section slidably interfitting with the end supports by way of identical holes in said end supports located adjacent the upper ends of the legs and equidistant from the lower ends of the legs for giving intermediate support to the log when it sags while burning, the distance between said end supports being freely adjustable along the rods and the sliding interfit of the rods with said end supports maintaining the end supports in vertical parallel relation.

4,640,264

FOOD AND DRINK WARMING CONTAINER

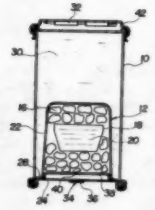
Tosinobu Yamaguchi, 386-28, Hirui-cho; Sigeru Aitoh, 2885-12, Akasaka-cho, both of Ogaki-shi, Gifu-ken, and Masafumi Hamasaki, 359-24, Kume, Tokorozawa-shi, Saitama-ken, all of Japan

Filed Oct. 22, 1984, Ser. No. 663,459

Claims priority, application Japan, Oct. 20, 1983, 58-161377; Dec. 5, 1983, 58-187020

Int. Cl.[4] F24J *1/00*

U.S. Cl. 126—263 **3 Claims**



1. A food and drink warming container comprising:

a container body for receiving therein a drink or food containing at least a liquid substance, said container having an open end;

a metallic can housed within said container body and having a cylindrical portion and a flange formed integrally with said cylindrical portion, said flange having a circumferential edge defining an open end of said metallic can and being curled and fixed to said container body for closing said open end of said container body, and said cylindrical portion being filled with quick lime;

a bag formed of rupturable synthetic resin material and containing therein water in an amount sufficient to expand said bag, said bag being disposed in said metallic can at a substantially central portion thereof and being entirely surrounded by said quicklime;

a cover member attached to said metallic can for closing said open end thereof, said cover member having formed therein a communication port in the form of a through hole;

an inner cover separating the interior of said cylindrical portion of said metallic can from said cover member, said inner cover being formed of a soft material and having formed therein a pair of crossed slits at a position aligned with said through hold of said cover member; and

a rod member formed separately from said cover member and said inner cover, said through hole and said slits permitting an end of said rod member to be inserted into said metallic can;

whereby water is brought into contact with said quick lime when said bag is ruptured by said rod member, thereby allowing a hydration reaction of said quicklime to take place for generating heat and thereby warming said drink or food to a predetermined temperature by said heat.

4,640,265

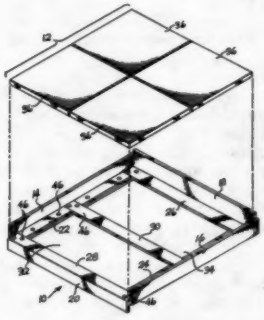
INSERT FOR CONVERTING A CONVENTIONAL HOME OVEN INTO A PIZZA OVEN

H. Duane Romo, 7105 - 156th SW., Edmonds, Wash. 98020

Filed Feb. 24, 1986, Ser. No. 832,850

Int. Cl.[4] F24C *15/16*

U.S. Cl. 126—337 R **14 Claims**



1. An oven insert for converting a conventional home oven into a pizza oven, comprising:

a rectangular frame having upstanding sidewalls, an upstanding rear wall, a depending front wall, and bottom wall portions bordering each of said side, rear and front walls, said bottom wall portions comprising bottom support surfaces settable on a wire oven rack, and said front wall depending below the bottom support surfaces an amount greater than the depth of a forward edge portion of the oven rack;

said frame including at least one open area defined by and betwen the bottom wall portions;

ceramic oven tile means supported on said bottom wall portions;

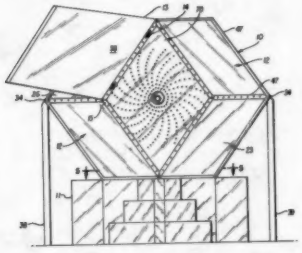
wherein in use the insert is supported on a wire rack in the oven, with the support surfaces of the bottom wall portions of the frame setting on the wire rack, and with the depending front wall of the frame being situated forwardly of a front edge portion of the wire rack, in a position to contact the forward edge and function as a stop, and also depending below the front edge of the rack, in a position to function as a handle.

4,640,266

SENSORY STIMULATION ENCLOSURE

Zubin Levy, 4718 Reeves Rd., Ojai, Calif. 93023

Filed Aug. 29, 1984, Ser. No. 645,193
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 R **17 Claims**



1. A sensory stimulation apparatus comprising an enclosure having a plurality of angularly related panel members and a door means, each of said panel members and said door means having inner and outer surface, each of said inner surfaces being mirrored, light emitting means mounted between each of said panel members adjacent said inner mirrored surfaces, means for movably mounting said door means, with respect to said panel members, a floor portion within said chamber, said floor portion having an inner mirrored surface, a housing mounted to said enclosure and extending outwardly with respect to said panel members, mounting means for moveably supporting said housing with respect to said panel members, first light projection means mounted within said housing so as to direct light through one of said panel members into said enclosure.

4,640,267

METHOD AND APPARATUS FOR NONDETRIMENTAL REDUCTION OF INFANT CRYING BEHAVIOR

Philip A. Lawson, 5950-28 SW. 20th Ave., Gainesville, Fla. 32607

Filed Feb. 27, 1985, Ser. No. 706,086
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—1 R **28 Claims**

1. A method for nondetrimental reduction of infant "crying" behavior, comprising the steps of:

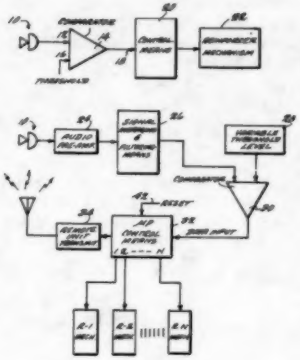
establishing a criterion response defined as vocal behavior equal to or above a predetermined audible level;

continuously monitoring the vocal behavior of said infant;

presenting an intermittent "positive reinforcer" (R1) to said infant noncontingently during absence of said criterion response;

suspending said presentation of said intermittent "reinforcer" (R1), when said monitored vocal behavior is in accord with said criterion response; and

presenting a positive reinforcer (R2) to said infant contingent upon the cessation of vocal behavior in accord with



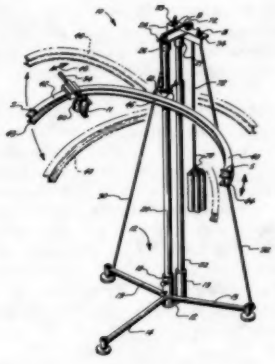
said criterion response for at least a predetermined time period $X2_1$.

4,640,268

MUSCULAR REHABILITATION APPARATUS FOR EXERCISING HUMAN BODY APPENDAGES

Bobby S. Roberts, 5504 Camphor St., Metairie, La. 70003

Filed Mar. 7, 1985, Ser. No. 709,512
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **10 Claims**



1. A muscular rehabilitation apparatus for exercising the human body appendages of a user through multiple geometric positions of the appendage with respect to the user's body, comprising:

a. a support base;

b. a curved track mounted for adjustable movement upon the base into multiple elevational positions including at least a position near the head of the user when standing;

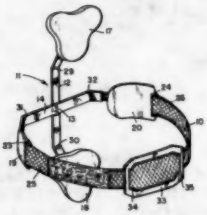
c. the track defining an arcuate path which tracks the outer extremity of a human appendage as it pivots about a joint thereby defining an exercise plane occupied by the appendage and the track;

d. carriage means mounted to move on the track between the end portions thereof for forming a connection to the appendage extremity; and

e. articulating adjustment means movably mounted with the track upon the base upwardly and downwardly for affix-

ing the curved track to the base and in multiple preselected positions with respect to the base including multiple elevational positions, multiple rotational positions wherein the track and the exercise plane can rotate with respect to the user, and multiple angular positions wherein the track and the exercise plane can form different angles with a horizontal plane.

4,640,269
BACK BRACE HAVING STRAP WITH WIDENED MIDDLE PORTION FOR PAD
Joan Goins, R.R. #6, Box 92, North Vernon, Ind. 47265
Filed Jul. 30, 1984, Ser. No. 635,834
Int. Cl.[4] A61F *5/01*
U.S. Cl. 128—78 **5 Claims**



1. In combination with a back brace of the type having an anterior frame configured to be applied to the anterior thoracic area of a person and a back pad configured to be applied to the lumbar area of a person and having strap means connected to said back pad and to said anterior frame for providing suitable tension therebetween, said back pad having vertical slots for receiving said strap means therethrough, the improvement comprising:

a strap constructed of a cloth-like material and having a middle portion, wherein said middle portion has a width dimension greater than the length dimension of either of said back pad slots, the middle portion of said strap freely overlying said back pad on a side opposite that side of said back pad which is applied to the lumbar area of the person, and being readily removable from said back pad, said strap having end portions each disposed through a respective slot of said back pad and secured to said anterior frame, whereby longitudinal displacement of said back pad with respect to said strap is precluded in normal use by said middle portion.

4,640,270
MALE ORGAN JACKET
Te-Chien Chin, 705 Windsor, Hercules, Calif. 94547
Filed May 6, 1985, Ser. No. 731,042
Int. Cl.[4] A61F *5/41*
U.S. Cl. 128—79 **4 Claims**

1. A penile prosthetic device comprising, in combination: base means, including a tubular base section adapted to hold and support a base portion of a penis shaft and a supporting strap, said tubular base section being securely connected to said strap, which in turn may be securely fastened to a lower abdominal area of a male body; extension means comprising a tubular extension section having two ends, one end having a larger diameter than the other end, the larger end being able to hold any portion of the base section tightly whereas the smaller end being able to be inserted closely inside a lower end of a top section, wherein the ends overlap; and said top section having

a tubular section and a glans-penis like top having a hole in its tip.

4,640,271
BONE SCREW
Jerry L. Lower, Bourbon, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed Nov. 7, 1985, Ser. No. 795,963
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YF **10 Claims**

1. A bone screw for connecting portions of bone across a fracture therebetween, comprising:

(a) a shaft comprising a leading end portion including a first set of uniformly pitched screw threads and an elongated, smooth unthreaded portion including a central portion and a trailing end portion;

(b) a sleeve member having a smooth inner cylindrical surface surrounding the elongated unthreaded portion and being freely slidable thereabout, the sleeve member including a second set of uniformly pitched screw threads thereon, the sleeve member adapted to be positioned substantially about the trailing end portion spaced apart from the first set of threads by the central portion;

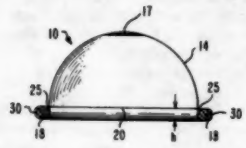
(c) a retaining means to prevent the sleeve member from sliding off the shaft; and

(d) a driving means on the trailing end portion to accommodate a tool for driving the screw.

4,640,272
SPRINGLESS DIAPHRAGMS AND METHOD OF PRODUCING SAME
Edward Monett, 639 Scotch Plains Ave., Westfield, N.J. 07090
Filed Oct. 11, 1983, Ser. No. 540,402
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—127 **14 Claims**

1. A springless diaphragm adapted to be inserted into a vaginal vault for birth control which comprises (a) a resilient rim member composed of a first flexible rubber material, and (b) a dome member composed of a second flexible rubber material, said rim member being securely bonded to, and extending continuously about the base of said dome member, said dome member in the upper portion thereof having a greater

thickness than the remainder of said dome member, said first rubber material being characterized by a Shore A Durometer



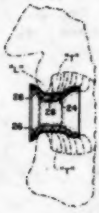
of from about 75 to 90, and said second rubber material being characterized by a Shore A Durometer of from about 30 to 45.

4,640,273

MOUTH GUARD FOR USE WITH A DIAGNOSTIC INSTRUMENT

Franklin R. Greene, Flushing; Howard S. Stern, Old Westbury, and Jerome D. Waye, New York, all of N.Y., assignors to E-Z-Em, Inc., Westbury, N.Y.

Filed May 8, 1985, Ser. No. 731,882
Int. Cl.[4] A61B *1/24*
U.S. Cl. 128—136 **11 Claims**



1. An annular disposable mouth guard having a main axis, said mouth guard comprising:

a relatively rigid center annular portion adapted to be held by a patient's teeth,

a first annular end portion, said first portion extending axially inward and radially outward from said center portion and adapted to be received within a patient's mouth;

a second annular end portion, said second portion extending axially forward and radially outward from said center portion to form a flange adapted to overlie the patient's lips when said first portion is in the patient's mouth;

a relatively hard plastic core extending through said first, center and second portions, said core having an opening to permit passage of a diagnostic instrument therethrough, said core being sufficiently rigid at said center portion to resist compression and prevent damage to the inserted diagnostic instrument when the patient bites down on said center portion of said mouth guard; and

a relatively soft plastic coat formed on the radially outer surface of said core to cushion the patient's bite,

the plastic material of said core being sufficiently flexible to provide a relatively flexible edge at the axially inward end of said first portion.

4,640,274

SURGICAL NEEDLE EXTRACTOR HAVING A DISPOSABLE CHUCK, A CHUCK AND A HANDLE

Takayuki Nakamoto, Tokyo, Japan, assignor to Iwata Electric Works Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,290
Claims priority, application Japan, Dec. 2, 1982, 57-212547
Int. Cl.[4] A61B *17/10*
U.S. Cl. 128—321 **35 Claims**

10. A chuck for a surgical needle extractor, said needle extractor having a handle, wherein said chuck is adapted to be releasably attached to a first recess in the body of said handle, wherein said handle further comprises an actuating rod adapted to actuate said chuck, wherein said chuck comprises:

(a) first and second members attached to one another, one end of each of said first and second members comprising a penetration portion for penetrating between the claws of a surgical needle;

(b) an actuated piece disposed between and pivotally attached to said first and second members at a pivot point; and

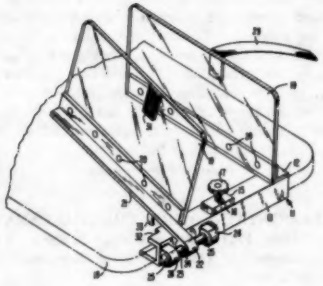
(c) means for releasably attaching said penetration portion and said actuated piece only in said first recess of said body of said handle and for releasably attaching said actuated piece within said first recess to said actuating rod of said handle.

4,640,275

HEAD RESTRAINT FOR BACKBOARDS

Vincent J. Buzzese, 324 Greenbrier Rd., Sunbury, Ohio 43074, and Mario Dohnert, Jr., 873 Mike Ct., Westerville, Ohio 43081

Filed Apr. 3, 1985, Ser. No. 719,506
Int. Cl.[4] A61F *5/37*
U.S. Cl. 128—133 **4 Claims**



1. A head restraining device for use with a backboard to immobilize the head and neck area of a person supported upon the backboard and apparently suffering cervical trauma, said head restraining device comprising:

a frame removably securable to one end of the backboard;

a pair of side plates, one of said side plates being fixedly and nonadjustably secured to one end of said frame to extend in a generally perpendicular orientation over the backboard when said frame is secured to the backboard;

support means secured to the other end of said frame opposite to said one end, said support means supporting the other of said pair of side plates for pivotal movement about a horizontal axis toward and away from the backboard and horizontal movement along said axis and along a portion of said frame whereby said other side plate can be pivoted into a generally perpendicular orientation over the backboard and horizontally moved toward said fixedly secured side plate to adjust said head restraining device for different head sizes; and

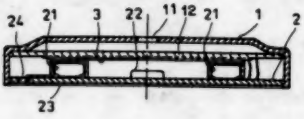
a fastener strap having one end fixedly secured to one of said pair of side plates and the other end adapted to be removably secured to the other of said pair of side plates, said fastener strap being positioned relative to said side plates such that it is adapted to be generally aligned with the forehead of a person supported upon the backboard when the strap is fastened to secure a person's head between said pair of side plates.

4,640,276

SUPER-THIN ENURESIS ALARM

Tseng Jing-Sheng, 5 Fl., No. 460-2, Kuang-Fu S. Rd., Taipei, Taiwan

Filed Mar. 20, 1985, Ser. No. 714,168
Int. Cl.[4] A61B 19/00
U.S. Cl. 128—138 A 1 Claim



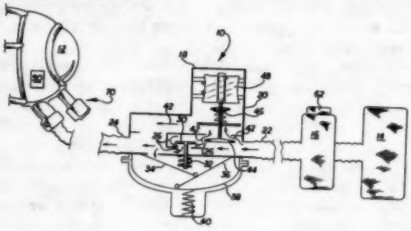
1. A super thin enuresis alarm comprising a buzzer case; double sided adhesive tape; a double sided printed circuit board having a first and a second side; melody producing integrated circuit means; and two batteries; said music producing integrated circuit means and batteries being fitted on said first side of said printed circuit board; said printed circuit board having a hole means therethrough for allowing two parallel conductors to pass from the first side to the second side; said conductors being spatially and electrically separated and having exposed conductive areas to form a switch; said buzzer case having a sound outlet on one side and a buzzer strip on another side; said double sided tape being placed against said buzzer strip; said printed circuit board being placed with said one side, and the batteries and integrated circuit thereon, against said double sided adhesive tape, thereby forming an enclosure containing all of said batteries, melody producing integrated circuit means, and buzzer strip.

4,640,277

SELF-CONTAINED BREATHING APPARATUS

Steven D. Meyer, Fort Worth, and Peter B. Raven, Irving, both of Tex., assignors to Texas College of Osteopathic Medicine, Fort Worth, Tex.

Filed May 17, 1984, Ser. No. 611,507
Int. Cl.[4] A62B 7/04
U.S. Cl. 128—204.23 11 Claims



1. A portable, self-contained breathing device of the type which may be used by industry and firefighters to protect a user from toxic atmospheric conditions, comprising:

a facepiece which can be worn on the face of a user to isolate the breathing functions of said user from ambient atmosphere;

a supply of pressurized breathing air to be supplied to said facepiece in response to the inhalation demand of said user;

air flow regulator means between said facepiece and said supply, said regulator means including a first air flow path and second air flow path, said first air flow path including first means to permit air passage from said supply to said facepiece in response to facepiece pressure decreases below a first preselected level, said second air flow path including second means which permits additional air passage from said supply to said facepiece in response to facepiece pressure decreases below a second preselected level lower than said first preselected level; and

an electrical power supply;

said first air passage means comprising:

a first valve member,

and means hydraulically responsive to changes in pressure in said facepiece caused by the breathing functions of said user to control the opening and closing of said first valve member; and

said second air passage means comprising:

a second valve member,

pressure-sensitive means responsive to pressure changes in said facepiece, and

means for opening said second valve member in response to a signal from said pressure sensitive means that facepiece pressure has decreased below said second preselected level;

wherein said first air flow path is capable of of comfortably providing said user with the volume of breathing air required by said user during light to moderate physical exertion, and

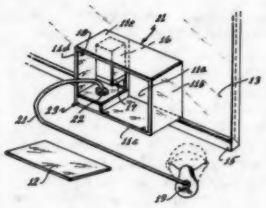
said pressure sensitive means is electrically connected to said electrical power supply to generate an electrical signal when said facepiece pressure has decreased below said preselected level.

4,640,278

EMERGENCY AIR ACCESS AND SIGNAL

John C. Barry, 1411 N. Fairfax #17, West Hollywood, Calif. 90046

Filed Aug. 20, 1984, Ser. No. 642,422
Int. Cl.[4] A62B 7/00
U.S. Cl. 128—206.12 7 Claims



1. An emergency fresh air access for use in a room having a window facing to the environment outside of the building and set in a casement, comprising: means forming a passage in said casement or window, means forming a housing, said housing having walls one of which is transparent, another of said walls being removable from the housing to thereby leave that portion of the housing covered by said wall open to provide an access, means for securing the transparent wall of the housing to the window, a breathing mask, said housing providing space for storing said mask, said mask being accessible through said access, a filter stage having an inlet and an outlet, said filter stage being carried in said housing, a first tube, said passage being just large enough to allow said first tube to pass therethrough, means for connecting one end of said first tube through the passage to the outside environment, connector means for connecting the other end of said first tube to the inlet of said filter stage, a second tube, means connecting one end of the second tube to the mask and the other end to the outlet of the filter stage so that said first tube, filter, second tube, and mask are connected in series to define an airflow path therethrough between the outside environment and the mask, a signal light mounted in the housing to shine through the win-

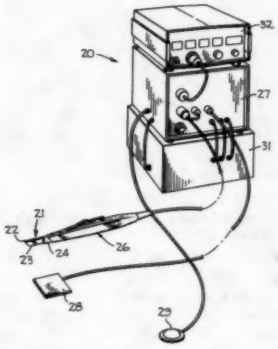
dow to which it is mounted, a power source for said signal light, switch means for connecting said light to said power source, said switch means mounted in proximity to said one wall to respond when the one wall is removed to switch on the light.

4,640,279

COMBINATION SURGICAL SCALPEL AND ELECTROSURGICAL INSTRUMENT

Robert W. Beard, Placerville, Calif., assignor to Oximetrix, Inc., Mountain View, Calif.

Filed Aug. 8, 1985, Ser. No. 763,549
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.14 **12 Claims**



1. A disposable assembly for a surgical instrument that cuts tissue mechanically and that applies electrical current to the tissue for causing coagulation, said assembly comprising:

an electrosurgical active electrode having

a tip at one end,

and electrical contact at the opposite end, and

an intermediate portion with a straight section;

a scalpel blade having

a shank section and

a blade section projecting from the shank section, said blade section having

a cutting edge and

a back edge that come together at a point remote from the shank section, the back edge including a straight portion positioned adjacent the straight section of the electrode with the electrode tip and the blade section point facing the same direction, the blade section point being spaced sufficiently from the electrode tip to prevent electrical shorting therebetween, the adjacent straight electrode section and back edge straight portion defining therebetween an axis of rotation; and

a body of electrically insulative material that joins the scalpel blade and the electrode for simultaneous movement and for simultaneous support, said body holding the scalpel blade and the electrode in spaced and opposed operational positions that are used sequentially by rotating the assembly one-half revolution about the axis of rotation.

4,640,280

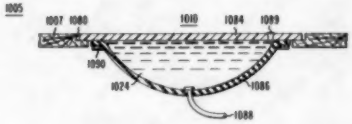
MICROWAVE HYPERTHERMIA WITH DIELECTRIC LENS FOCUSING

Fred Sterzer, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 12, 1985, Ser. No. 764,744
Int. Cl.[4] A61N *5/02*
U.S. Cl. 128—804 **5 Claims**

1. An apparatus for focusing radio frequency or microwave electromagnetic energy within tissues being treated, comprising:

a lens having, when operating, a cross-section substantially in the shape of a section of a circle, said lens comprising an enclosure defining a cavity and also comprising means for filling said cavity with a dielectric liquid having a dielectric constant greater than about 6, said enclosure including a horizontally oriented flat rigid base including a periphery, said base being adapted for being placed under and in



contact with said tissues being treated, and a sheet of resilient material attached to said periphery and depending from said base, said sheet of resilient material being adapted to be deformed into approximately semispheric shape by said dielectric liquid; and

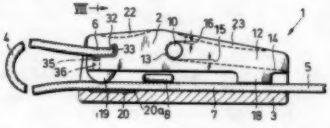
a source of said radio frequency or microwave electromagnetic energy placed below and spaced away from said sheet of resilient material for directing energy upward toward said lens whereby said energy is focused on said tissues.

4,640,281

TOURNIQUET

Gerd-Jochen Sturm, Leverkusen, and Wolfgang Wehking, Cologne, both of Fed. Rep. of Germany, assignors to Prämeta Präzisionsmetall- und Kunststofferzeugnisse G. Baumann & Co., Cologne, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 806,977
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445794; Oct. 30, 1985, 3538583
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—327 **20 Claims**



1. A tourniquet comprising a belt and a buckle, said buckle having first and second buckle parts, means for connecting a first end of said belt to said first buckle part, means for releasably clamping a second end of said belt between said first and second buckle parts, a loop between said first and second belt ends, interengaged pivot pin and recess means for cooperatively slidably securing and releasing said first and second buckle parts and effecting pivotal movement therebetween, means for imparting relative pivotal movement between said first and second buckle parts to effect the clamping of said belt second end therebetween by said clamping means, said pivot pin means being positioned between said clamping means and said movement imparting means, and said pivotal movement imparting means being cam means operative upon relatively slidably securing said first and second buckle parts together to automatically relatively pivot said first and second buckle parts and thereby clamp said second belt end by said clamping means.

4,640,282

BABY PACIFIER

Bengt R. Careborg, Vetlanda, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Feb. 28, 1985, Ser. No. 706,547
Claims priority, application Sweden, Mar. 2, 1984, 8401160
Int. Cl.[4] A61J 17/00
U.S. Cl. 128—360 3 Claims

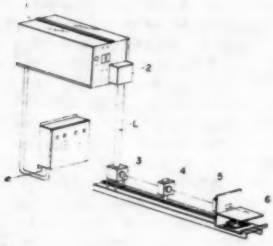
1. A baby pacifier comprising:
(1) a resilient nipple for the baby to grasp in its mouth; and having an open end with a bead extending about its outer periphery adjacent to the open end;
(2) a circular box-shaped housing constituting a shield for supporting the nipple;
(3) the shield being substantially elliptical in cross-section, and having an external surface that is smooth and continuous in extent over the entire shield, free of any projections, and having a diameter of at least 45 mm and a breadth of at least 20 mm, being formed in two housing parts held together; each housing part having a peripheral edge engaging the peripheral edge of the other housing part in a snap lock;
(4) one housing part having an aperture receiving the open end of the nipple and having an aperture wall extending over the bead and thus retaining the nipple to the housing part; the housing part also having an inwardly projecting cylindrical wall beside the aperture and abutting the bead;
(5) the other housing part having an inwardly-extending projection sized to fit within the cylindrical wall and the open end of the nipple, and long enough to fix the bead of the nipple in a position defined by the cylindrical wall when the housing parts are locked together.

4,640,283

METHOD OF CURING ATHLETE'S FOOT BY LASER BEAM IRRADIATION

Shigeki Sawa, Kanazawa, and Hiroshi Ueda, Komatsu, both of Japan, assignors to Shibuya Kogyo Co. Ltd., Ishikawa, Japan

Filed Apr. 25, 1984, Ser. No. 603,543
Claims priority, application Japan, Dec. 19, 1983, 58-239563
Int. Cl.[4] A61N 5/00
U.S. Cl. 128—395 5 Claims



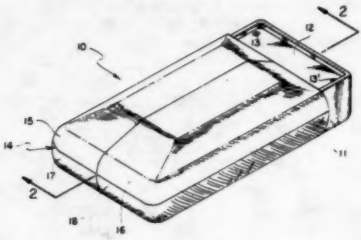
1. A method for curing athlete's foot by applying a laser beam having the energy density of 2 Joules/cm^2 or more to an area of a person's skin affected by dermatophytosis for a predetermined time period of 10 milliseconds or less at least once.

4,640,284

HOT AND COLD DIRECT CONTACT APPLICATOR

Max J. Ruderian, 545 Hanley Ave., W. Los Angeles, Calif. 90049

Filed Jul. 22, 1985, Ser. No. 757,380
Int. Cl.[4] A61F 7/00
U.S. Cl. 128—399 5 Claims



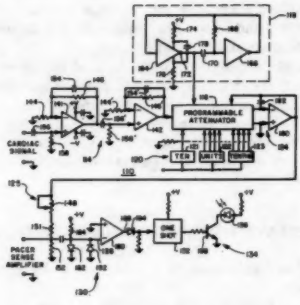
1. A hot and cold direct contact applicator comprising:
hot and cold parallel thermally conductive plates defining a space therebetween;
circuit means fixed to said hot and cold plates in said space between the same;
said circuit means being actuable by a voltage applied thereto to cause heat to be withdrawn from said cold plate and to cause heat to be added to said hot plate;
a thermally conductive auxiliary plate parallel to said hot and cold plates;
a plurality of thermally conductive parallel vanes fixed between and to said hot and auxiliary plates to act as a heat sink and dissipate at least some of the heat retained in said hot plate, said vanes defining spaces therebetween; and
a fabric sock positioned around said cold and auxiliary plates, said sock having different circumferential swatch portions of different corresponding thermal insulation.

4,640,285

SENSE MARGIN EVALUATION SYSTEM AND METHOD FOR USE SAME

Robert DeCote, Jr., Miami Beach, and Peter P. Tarjan, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Jan. 22, 1985, Ser. No. 693,675
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 PT 36 Claims



1. An apparatus for enabling an in-vivo determination of the ratio or "sense margin" between the effective amplitude of a

cardiac signal (R-wave or P-wave) from a patient's heart and the minimum attenuated amplitude of said signal which can be readily sensed by a sense amplifier in a pacer to be implanted in the patient's heart where:

$$\text{Sense Margin} = \text{Maximum allowable signal attenuation} = \frac{\text{Effective cardiac amplitude}}{\text{Effective pacer sense amplifier threshold}}$$

said apparatus comprising:

a bandpass adjustable attentuator circuit having an input and an output, said bandpass being greater than the bandpass of the sense amplifier and the frequency spectrum of the cardiac signal;

first means for coupling said attenuator circuit input to at least one cardiac signal sensing probe connected to the patient's heart;

second means for coupling said attenuator circuit output to the sense amplifier in the pacer;

means coupled to the pacer for detecting a pacing pulse generated by the pacer;

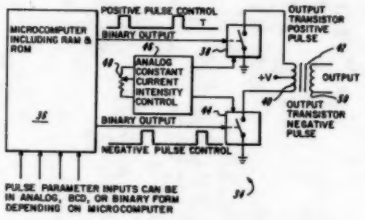
means coupled to said attenuator circuit for controlling cardiac signal attenuation and for ascertaining the amount of attenuation at the time a pacing pulse is detected to enable a numerical determination of the sense margin ratio to be made by expression of the maximum attenuation value as a ratio of: signal input/signal output.

4,640,286

OPTIMIZED NERVE FIBER STIMULATION

Thomas H. Thomson, Boulder, Colo., assignor to Staodynamics, Inc., Longmont, Colo.

Filed Nov. 2, 1984, Ser. No. 667,873
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—421 **25 Claims**


MICROCOMPUTER INCLUDING RAM & ROM
POSITIVE PULSE CONTROL
BINARY OUTPUT
ANALOG CONSTANT CURRENT INTENSITY CONTROL
BINARY OUTPUT
NEGATIVE PULSE CONTROL
OUTPUT TRANSISTOR POSITIVE PULSE
+V
OUTPUT
OUTPUT TRANSISTOR NEGATIVE PULSE
PULSE PARAMETER INPUTS CAN BE IN ANALOG, BCD, OR BINARY FORM DEPENDING ON MICROCOMPUTER

1. A method for optimizing electrical stimulation of nerve fibers having predetermined refractory periods and enhanced excitability conditions that occur during known periods following the occurrence of an action potential, said method comprising:

generating a first pulse of positive polarity and applying said first pulse to nerve fibers to be electrically stimulated to thereby set said fibers;

generating a second pulse of negative polarity and applying said second pulse to said nerve fibers to be electrically stimulated to cause excitation thereof, with said second pulse being generated at a time subsequent to said first pulse that is substantially equal to that of the refractory period for said nerve fibers then to be stimulated; and

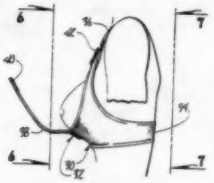
repeatedly generating said first and second pulses with each occurrence of said first and second pulses being timewise spaced from each adjacent first and second pulses a distance based upon the timewise occurrence of said enhanced excitability condition of said preselected nerve fibers to be stimulated to thereby optimize stimulation of said nerve fibers and substantially increase the activity thereof.

4,640,287

RELEASABLE FASTENING MEANS AND METHOD FOR CLOTHING ITEMS, PARTICULARLY CAPS, BRASSIERS, AND NURSING BRASSIERS

Raymond G. Anderson, and Doris E. Anderson, both of 206 N. Sharmin St., Ankeny, Iowa 50021

Filed Aug. 16, 1984, Ser. No. 641,262
Int. Cl.[4] A41C *3/04*
U.S. Cl. 128—460 **2 Claims**



1. A nursing brassiere which allows easy but releasable fastening and unfastening of a nursing flap comprising:

a brassiere having breast pockets and having openable and closeable nursing flaps for nursing purposes associated with each breast pocket;

said nursing flaps having a movable portion having at least one side attached to said nursing brassiere;

a pull away attachment means secured to said movable portion for simple pulling release of said flap to expose the breast for nursing and for simple pressing closure of said flaps;

said pull away attachment comprising at least two base pads having a plurality of closely positioned outwardly-extending pile loops of thread-like material attached to one of said pads and having a plurality of closely positioned outwardly-extending pile hook members attached to the other of said pads, so that upon pressing engagement of said pads many of said loops and said hooks engage, one of said pads being attached to said nursing flap and the other being located on said brassiere to allow said pads to engage on pressing closure of said flap.

4,640,288

ADHESIVE PAD FOR USE ON HUMAN BODY

Morihisa Hattori, Nishinomiya, Japan, assignor to Nikko Kakouzai Co., Ltd., Osaka, Japan

Filed Sep. 26, 1984, Ser. No. 654,630
Claims priority, application Japan, Sep. 28, 1983, 58-181209
Int. Cl.[4] A61J *13/00*
U.S. Cl. 128—505 **4 Claims**

1. An adhesive pad for use on human body which comprises:

a flexible sheet of diaphanous plastic material,

an adhesive layer applied onto the entire underside of the sheet, and

a flexible film of diaphanous plastic material laminated on said adhesive layer, said film having less planar dimen-

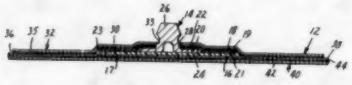
sions less than the sheet and being centrally disposed thereon so as to leave said adhesive layer exposed thereabout, said exposed adhesive layer defining an annulus of adhesive coating on the marginal portion of the sheet for securing the pad onto a selected area on the human body and defining inside thereof a non-adhesive and translucent area, said film having thereon a smooth surface which is adapted to be in adhesive-free contact with the portion on the human body, and said non-adhesive and translucent area allowing that portion of the body covered thereby to be seen through the lamination of the sheet and the film.

4,640,289

BIOMEDICAL ELECTRODE

Lawrence W. Craighead, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1983, Ser. No. 551,069
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 **7 Claims**



1. A biomedical electrode comprising:

a. an electrical terminal member comprising a base having upper and lower surfaces and a post integral with said upper surface of said base and extending therefrom, said post presenting an exposed surface adapted for direct physical and for electrical connection to a lead wire of an electro-medical device;

b. an ionically conductive layer in physical and electrical contact with the entire lower surface of said base and extending peripherally beyond said base; and

c. a conformable retainer sheet having upper and lower major surfaces bound together by an edge surface, having a surface area and shape larger than that of the terminal base, and having an aperture therethrough receiving and surrounding the post, the aperture being spaced apart from the edge surface and dimensioned with a perimeter larger than the largest perimeter of the post and smaller than the largest perimeter of the base such that a portion of the lower surface of the retainer sheet contacts the upper surface of the base and the remainder of the lower surface the retainer sheet contacts the portion of the ionically conductive layer extending peripherally beyond the base to positionally confine said electrical terminal member between said retainer sheet and said ionically conductive layer; and

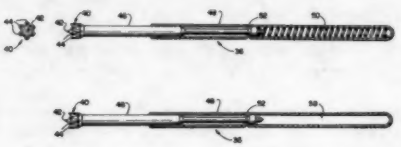
d. a medical tape comprising a backing and a pressure sensitive adhesive coating on at least one major surface thereof, the tape having an aperture therethrough receiving and surrounding said post, the aperture being dimensioned with a perimeter larger than the largest perimeter of the post and smaller than the perimeter of the retainer sheet, a portion of the adhesive-coated surface being adhered to the upper surface of the retainer sheet and the remaining portion of the adhesive-coated surface extending beyond the peripheral edges of the retainer sheet and the ionically conductive layer to assist in securing the electrode to skin.

4,640,290

SHIELDED, SELF-PREPARING ELECTRODE SUITABLE FOR ELECTROENCEPHALOGRAPHIC MAPPING

Gary W. Sherwin, South Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1985, Ser. No. 727,058
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 **17 Claims**



1. A shielded, self-preparing electrode, connectable to a coaxial cable having inner and outer conductors, for sensing an electrical potential of a blood-rich skin layer covered by a dead skin layer, said electrode comprising:

potential sensing means, connectable to the inner conductor of the coaxial cable, for penetrating the dead skin layer, sensing the electrical potential of the blood-rich skin layer, absorbing a part of a penetrating force exceeding a force required to penetrate the dead layer of skin and helping prevent penetration of the blood-rich skin layer; and

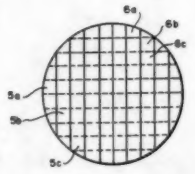
shell means, connectable to the outer conductor of said coaxial cable, for securely holding and providing electromagnetic shielding for said potential sensing means and absorbing a remainder of the penetrating force exceeding the force required to penetrate the dead layer of skin.

4,640,291

BI-PLANE PHASED ARRAY FOR ULTRASOUND MEDICAL IMAGING

Pieter 't Hoen, Mission Viejo, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 27, 1985, Ser. No. 749,613
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **3 Claims**



1. A transducer array for ultrasonic medical imaging comprising:

a flat disc of a composite piezoelectric material, said composite material having a plurality of cylinders of a piezoelectric material disposed in an insulated damping material, each cylinder extending from one major surface of said disk to the other major surface of said disk perpendicular to the diameter of said disk, each of said cylinders being completely surrounded by said insulated damping material;

a conductive electrode material laminated on each of the major surfaces of said disc, forming electrode surfaces;

each of said electrode surfaces being scored to provide regions of electrically separated electrode elements, the scoring of one electrode surface being at an angle to the scoring of the second electrode surface whereby said regions overlie said plurality of cylinders so as to define a matrix of transducer elements;

a mechanical lens over one electrode surface;

means to connect alternately all electrode elements on one electrode surface with phased-array electronics while

grounding the electrode elements on the other electrode surface thereby to successively connect portions of said transducer elements to form successive transducer subarrays in order to effect a sector scan in each of two planes, such that an image in one direction is followed by an image in a second direction, thus producing a dynamic image of a bodily function.

4,640,292

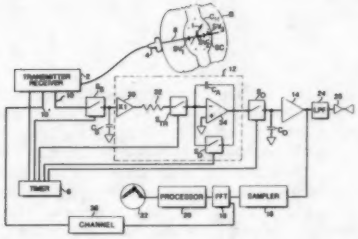
EXTENDING SAMPLE VOLUME IN PULSED DOPPLER SYSTEMS

Alexander Tykulsky, Carlisle; Karl E. Thiele, Melrose, and Leslie I. Halberg, Malden, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 619,881, Aug. 24, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 827,670

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—661 **4 Claims**



1. A method for operating an ultrasonic pulsed Doppler system in such manner as to obtain the velocity distribution of scatterers along the path of the Doppler pulse and within a volume having a length along the line of propagation of the pulse that is greater than the length of the sample volume, defined by the length of said Doppler pulse, along the line of propagation, comprising the steps of:

launching pulses of alternating waves at a given rate into a medium containing the scatterers,

obtaining a plurality of samples of the reflections of each launched pulse at respectively successive times so that each sample is of the reflections of scatterers contained in a different sample volume,

accumulating said samples so as to derive an accumulated sample to which all samples contribute, and

coupling the accumulated sample to processing means therefor to provide a signal representative of Doppler shift encompassed by all said different sample volumes.

4,640,293

SPIROMETER ACCESSORY

Dietmar R. Garbe, Maids Moreton House, Maids Moreton, Buckingham, England

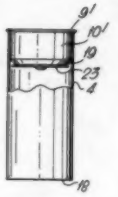
Continuation of Ser. No. 430,689, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 201,286, Oct. 27, 1980, abandoned. This application Jan. 18, 1985, Ser. No. 692,704

Claims priority, application United Kingdom, Oct. 27, 1979, 7937320; Sep. 23, 1980, 8030676

Int. Cl.⁴ A61B *5/08*

U.S. Cl. 128—716 **8 Claims**

1. An inlet for use with a spirometer responsive to the exhalation flow of breath gases from a patient, said inlet comprising an inlet tube having an inlet end for the entry of said exhalation flow and an outlet end for connection to the spirometer; a mouthpiece having a first and second end and an internal bore, said mouthpiece being in engagement at its first end with said inlet end of said inlet tube as an exhalation flow inlet thereto; an apertured valve seating member carried by said mouthpiece and being formed to extend across said bore; a valve diaphragm formed of thin flexible material, said diaphragm having a peripheral region, a central region and an intermediate region between said peripheral region and said central region; said valve seating member having an axially projecting outer rim and a diaphragm mounting means positioned within said outer rim, said diaphragm mounting means having a central mount and at least three radially extending spokes connected between said central mount and said sidewall for retaining said diaphragm by said central region thereof in an axial position such that said diaphragm flexes toward the outlet end of said inlet tube and said diaphragm lies in a first plane with said peripheral region of said diaphragm in sealing engagement with said outer rim; said spokes having cross-sections that provide laminar flow therearound in a direction from said first



end to said second end of said mouthpiece to minimize flow resistance therethrough; said diaphragm mounting means further including inner members extending laterally from each of said spokes, said spokes and said inner members being axially displaced from said first plane in a direction toward the first end of said mouthpiece such that said inner members lie in a second plane parallel to and axially displaced from said first plane whereby, under zero flow conditions, said diaphragm lies in said first plane and engages only said outer rim and, under reverse flow conditions, said diaphragm distorts and engages said inner members at said intermediate region thereof thereby preventing disengagement of said diaphragm from sealing engagement with said outer rim.

4,640,294

ASSEMBLY METHOD AND APPARATUS FOR SPLINE-TYPE CONNECTION

Richard A. Ordo, Greenwood, Ind., Assignor to General Motors Corporation, Detroit, Mich.

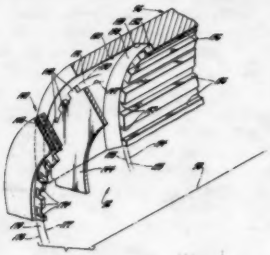
Filed Mar. 1, 1985, Ser. No. 707,391

Int. Cl.⁴ F16D *13/52*

U.S. Cl. 192—70.2 **11 Claims**

9. In a clutch having a first member defining one of an inside cylindrical wall and an outside cylindrical wall aligned on an axis of said clutch, a plurality of first annular clutch plates connected to said one cylindrical wall and disposed in planes perpendicular to said axis, and a plurality of second annular clutch plates disposed between respective ones of said first clutch plates in planes perpendicular to said axis, the combination comprising, a second member defining the other of said inside and said outside cylindrical walls, means operative to support said second member relative to said first member such that said inside and said outside cylindrical walls are concentric and rotatable relative to each other about said axis, means on each of said second clutch plates defining a plurality of angularly spaced spline teeth projecting from a circular edge of said second clutch plate and disposed in an imaginary annulus concentric with said circular edge, means on said second member defining at one end of said other cylindrical wall and in a plane perpendicular thereto a staging annulus corresponding in size to said imaginary annulus with a first edge coincident with said other cylindrical wall, means on said second member defining a centering guide shoulder extending longitudinally outboard from the plane of said staging annulus having one edge coincident with a second edge of said staging annulus, and means on said second

member defining a plurality of spline grooves in said other cylindrical wall intersecting said staging annulus at a corresponding plurality of notches angularly spaced to register with said spline teeth.



4,640,295

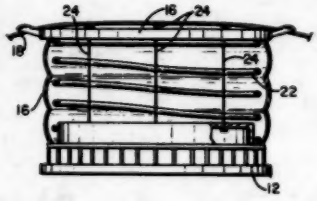
TOCODYNAMOMETER

Philip O. Isaacson, Chanhassen, Minn., assignor to Aequitron Medical, Inc., Minneapolis, Minn.

Filed Nov. 14, 1985, Ser. No. 798,162

Int. Cl.[4] A61B 5/03

U.S. Cl. 128—748 13 Claims



1. An apparatus for housing a pressure transducer for measuring intra-amniotic pressure through the abdominal wall of an obstetric patient, comprising

(a) a ring-shaped housing having a smooth lower surface and a center opening therethrough;

(b) a transducer member loosely fitted in said center opening, said transducer member having a smooth lower surface proximately aligned with said ring-shaped housing smooth lower surface;

(c) a leaf spring having respective ends affixed to said ring-shaped housing opposite its lower surface and having a center point affixed to said transducer member, said leaf spring having one or more strain gauges affixed thereon;

(d) an outer housing spaced away from said ring-shaped housing and a compression spring seated between said outer housing and said ring-shaped housing to bias the respective housings in spaced apart relation;

(e) means, connected between said outer housing and said ring-shaped housing, for at least partially compressing said compression spring; and

(f) means for attaching a belt to said outer housing.

4,640,296

BIOPSY CANNULA

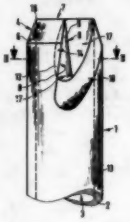
Wolfram Schnepp-Pesch, Schönblick 6, D-7505 Ettlingen 8, and Josef Lindenberg, Buchenweg 13, D-7512 Rheinstetten 4, both of Fed. Rep. of Germany

Continuation of Ser. No. 570,501, Jan. 13, 1984, abandoned. This application Dec. 10, 1985, Ser. No. 807,248

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341117

Int. Cl.[4] A61B 10/00

U.S. Cl. 128—754 6 Claims



1. A biopsy cannula comprising a cylindrical jacket wall surrounding an axial hollow space for receiving a tissue specimen, a distal end of the cannula being conically tapered to form a substantially ring-shaped cutting edge, at least one axially extending recess provided at the distal end and opening in a direction of the distal end, at least one cutting side extending substantially tangentially from an inside surface of the cylindrical jacket wall toward an outside surface thereof, and at least one cutting edge extending substantially parallel to a longitudinal axis of the cannula provided on at least one side of the recess, the cutting edge being formed by a cutting side of the cylindrical jacket wall whereby the cutting edge is disposed in the outer periphery of the cylindrical jacket wall.

4,640,297

FLUID SAMPLING DEVICE

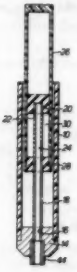
William T. D. Bates, Daventry, England, assignor to Bilbate Limited, Daventry, England

Filed Jan. 23, 1985, Ser. No. 694,091

Claims priority, application United Kingdom, Jan. 24, 1984, 8401754

Int. Cl.[4] A61B 5/14

U.S. Cl. 128—765 7 Claims



1. A suction generating device comprising a barrel, a hollow plunger having inner and outer ends and co-axially received within said barrel, means for manually moving said plunger within said barrel co-axially therewith, a first seal slideably received within said plunger intermediate the ends thereof, means fixing said first seal against movement relative to said barrel, a second seal carried by said plunger proximate its inner end and movable therewith, the space within the hollow plunger between said first and second seals defining a chamber, said plunger and seals being constructed and arranged such

that inward movement of said plunger relative to said barrel causes said second seal to move away from said first seal to increase the volume of said chamber, and inlet means connected to said chamber, inward movement of said plunger to increase the volume of said chamber causing suction at the inlet means.

4,640,298

ESOPHAGEAL ELECTRODE PROBE USEFUL FOR ELECTRICAL STIMULATION OF THE HEART

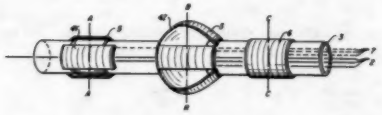
Peter Pless, Åsumvej 460, 5240 Odense NO, and Henning R. Andersen, Fruens Boge Alle 4, 5250 Odense SV, both of Denmark

Continuation of Ser. No. 671,023, Nov. 14, 1984, abandoned, which is a continuation of Ser. No. 517,395, Jul. 26, 1983, abandoned, which is a continuation of Ser. No. 321,173, Nov. 12, 1981, abandoned. This application Jul. 29, 1985, Ser. No. 759,930

Claims priority, application Denmark, Jun. 3, 1980, 2380/80

Int. Cl.⁴ A61N *1/04*

U.S. Cl. 128—784 **3 Claims**



1. An electrode probe adapted to be inserted into the esophagus of a patient and to provide stimulation of the heart which comprises a central tube provided with radially expansible fixing means at its distal end for axial positioning of the probe with respect to the stomach, a maximum of two stimulation zones selected from a first stimulation zone being positioned on a radially expansible part of the probe at a first distance of about 9 cm from the fixing means and a second stimulation zone being positioned on a radially expansible part of the probe at a second distance of about 4 cm from the fixing means, said first and second distances being predetermined on the basis of the distance from the transition between stomach and esophagus to the transition between the left atrium and the left ventricle so as to ensure that each of the first and second stimulation zones upon expansion of the expansible parts is in close contact with the posterior side of the left atrium or ventricle respectively, and

an inert electrode being positioned with respect to said stimulation zones as to provide an electrical field through the heart.

4,640,299

DRYING AND CONDITIONING APPARATUS FOR TOBACCO

Takahiro Ono, Hiratsuka; Takao Akutsu, Tokyo, and Hideyuki Fujiwara, Hadano, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,043

Claims priority, application Japan, Dec. 23, 1983, 58-242088

Int. Cl.⁴ A24B *3/04*

U.S. Cl. 131—303 **4 Claims**

1. An apparatus for drying and conditioning tobacco leaves, comprising:

a chamber for conditioning tobacco leaves therein;

means for drying the tobacco leaves prior to conditioning in said chamber;

means cooperating with said chamber for circulating conditioning air through said chamber for conditioning the tobacco leaves therein;

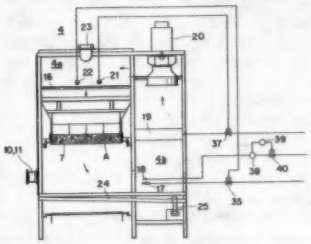
means in the path of the conditioning air for heating the conditioning air;

a temperature detector in the path of the conditioning air for measuring the temperature of the conditioning air;

temperature controlling means cooperating with said temperature detector and said heating means for controlling said heating means so that the temperature of the conditioning air becomes a pre-set temperature;

means in the path of the conditioning air for spraying atomized water in the conditioning air for cooling the conditioning air;

means in the path of the conditioning air for injecting steam



into the conditioning air for humidifying the conditioning air;

a humidity detector in the path of the conditioning air for measuring the humidity of the conditioning air; and,

means cooperating with said humidity detector and said steam injecting means for controlling said steam injecting means so that the moisture content of tobacco leaves reaches a target moisture content.

4,640,300

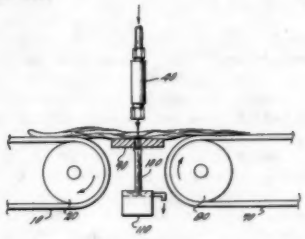
HIGH-PRESSURE WATER-JET STRIPPING OF TOBACCO

G. A. John Coleman, Richmond, Va., assignor to Universal Leaf Tobacco Company, Incorporated, Richmond, Va.

Filed Dec. 17, 1984, Ser. No. 682,772

Int. Cl.⁴ A24B *5/04, 5/06*

U.S. Cl. 131—318 **10 Claims**



9. A method of cutting a plurality of tobacco leaves into strips, said method comprising the steps of:

feeding the tobacco leaves along a predetermined path;

receiving the tobacco leaves at a station comprising a plurality of liquid jet nozzles;

cutting the tobacco leaves received at said station into strips by subjecting them to high-pressure liquid from the plurality of liquid jet nozzles; and

separating the strips of tobacco leaves with stems from strips of tobacco leaves without stems.

4,640,301

FOLDABLE WALKER WITH PLUNGER ACTUATED LATCH ASSEMBLY

Joseph D. Battiston, Sr., and Joseph Battiston, Jr., both of Clifton, N.J., assignors to Tubular Fabricators Industry, Inc., Passaic, N.J.

Division of Ser. No. 440,051, Nov. 8, 1982. This application May 2, 1985, Ser. No. 729,724

Int. Cl.⁴ A61H *3/00*

U.S. Cl. 135—67 **9 Claims**

1. A collapsible walker for the elderly and the infirm, comprising:

A. a cross brace having a bearing at each of its extremities;

B. a pair of gate legs, with one of said gate legs pivotally mounted in each of said bearings for rotation between an opened position, wherein said gate legs are positioned generally transverse to said cross brace, and a collapsed position wherein said gate legs are folded against said cross brace; and

C. a releasable locking assembly mounted on each gate leg and said cross brace adjacent the extremities thereof, each said locking assembly adapted to releasably lock the respective gate leg in the opened position with respect to said cross brace;

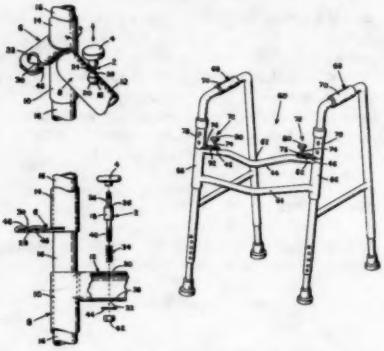
each said locking assembly comprising:

(a) a spring biased reciprocating latch;

(b) a plunger attached to said latch;

(c) an open ended catch plate adapted to releasably engage said latch;

(d) said spring biased latch reciprocably mounted within said cross brace and comprising a longitudinally extended locking bolt adapted for retractable protrusion from said cross brace, a reduced diameter guide rod extending from said locking bolt external to said cross brace, and a cam surface located between said locking bolt and said guide rod, and adapted to slidably engage said catch plate;



(e) said catch plate mounted external to the respective gate leg and substantially parallel to said cross brace when said gate leg is in said opened position and substantially transverse to said cross brace when in said collapsed position, said catch plate comprising a collar adapted to releasably retain said locking bolt, and a track communicating with said collar defining an access way for said latch to enter and escape from said collar; and

(f) said plunger mounted on said guide rod on the free end thereof, to receive and transmit pressure against said locking bolt to urge said locking bolt into the retracted position, for release from said collar.

4,640,302

DOUBLE DISC GATE VALVE

Thomas T. Impey, 631 Camelia St., Berkeley, Calif. 94710

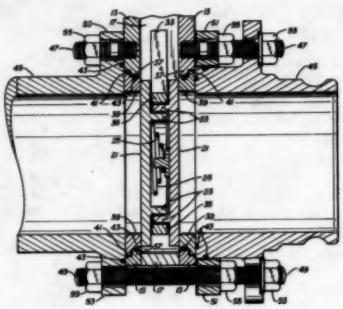
Filed Jun. 9, 1986, Ser. No. 871,802

Int. Cl.[4] F16K *43/00, 3/06, 25/00*

U.S. Cl. 137—15 **4 Claims**

3. A method for repairing downstream leaks in a double disc gate valve having upstream and downstream sealing rings and mating discs for each in the valve gate without disassembly of the valve including the steps of

providing the valve with at least a downstream sealing ring and a removable gate disc which are retained in the gate valve by an outlet connection and the downstream sealing ring and that disc of the valve gate which is mated with it can be removed from the valve and replaced with new parts when the outlet connection is disconnected from the valve, and



replacing only the downstream sealing ring and the removable gate disc of the valve when it begins to leak.

4,640,303

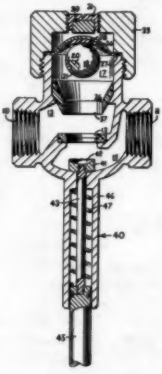
SEISMIC ACTIVATED VALVE

Donald S. Greenberg, 11228 Barnett Valley Rd., Sebastopol, Calif. 95472

Filed May 20, 1985, Ser. No. 720,572

Int. Cl.[4] F16K *17/36*

U.S. Cl. 137—38 **12 Claims**



1. A seismically actuated valve comprising

a. a valve body having an inlet, an outlet, and a normally horizontal valve seat located between said inlet and said outlet,

b. a closure member located above said valve seat, said closure member being spherical and made of ferromagnetic material,

c. a cavity located above said valve seat, said cavity being sufficiently large that said closure member may reside within it,

d. a dome located at the upper end of said cavity, said dome forming the continuous and concave upper surface of said cavity,

e. a magnet located above said dome.

4,640,304

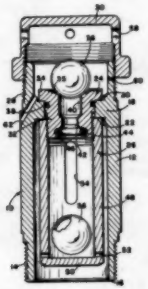
OVERFLOW VENT VALVE

Raymond H. Looney, Tulsa, Okla., assignor to Baird Manufacturing Company, Tulsa, Okla.

Filed Mar. 22, 1985, Ser. No. 714,982

Int. Cl.[4] F16K *24/04*

U.S. Cl. 137—202 **3 Claims**



1. An overlfow vent valve comprising outer housing means, pressure responsive normally closed check valve means disposed within the outer housing means and responsive to excessive pressure in the housing means for exhausting the pressure therefrom, ported cage means secured to the check valve means and suspended within the interior of the outer housing means, the interior of the ported cage means being in communication with the interior of the outer housing means for receiving fluid pressure therefrom and in communication with the check valve means, said ported cage means including (a) a sleeve member having one end open for communication with the check valve means and the opposite end thereof closed, (b) first port means provided in the proximity of the closed end whereby any liquid present in the interior of the outer housing initially enters the interior of the ported cage means and (c) slot means provided in said sleeve member in the proximity of the open end, said slot means being of larger area than the area of said first port means, secondary valve seat means provided on the check valve means and opens to the interior of the ported cage means, valve closure means loosely disposed within the ported cage means and is not in the proximity of said slot means when said valve closure means is adjacent the closed end of said sleeve member for engaging the secondary valve seat means when the liquid level rises sufficiently within the ported cage means whereby gaseous components of a flow stream may be exhausted through the check valve means and liquid components of the flow stream are precluded from discharge through the check valve means.

4,640,305

HIGH TEMPERATURE, ZERO LEAKAGE PACKING ASSEMBLY

Roger E. Johnson, Girard, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 14, 1984, Ser. No. 671,477

Int. Cl.[4] F16K *41/02*; F16J *15/40*

U.S. Cl. 137—312 **16 Claims**

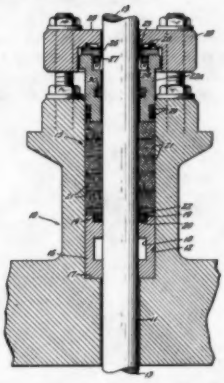
11. In a high pressure control valve including a valve body, an opening formed through said valve body and a valve stem extending through said opening, a packing assembly to form a leak tight seal between said valve stem and said opening, which comprises,

(a) a plurality of series arranged, axially stacked sealing barriers, and

(b) a cartridge element being arranged and configured to house and enclose each of said sealing barriers,

(c) whereby said cartridge element and enclosed sealing barriers comprise an integral unit to thereby provide a means to easily remove and replace all of said series arranged, axially stacked sealing barriers at one time by removing and replacing the cartridge element, and

(d) said cartridge element includes a lowermost bushing element having an internal fluid chamber arranged to form a fluid reservoir around a portion of said valve stem, whereby high pressure fluid leakage between the bushing element and the valve stem expands into and accumulates



within the reservoir to provide an anti-pumping effect during valve opening operation and a precipitation of solid particles from the accumulating fluid, said reservoir accumulates the solid particles therein during the movement of said valve stem to prevent the particles from reaching and deteriorating the sealing barriers.

4,640,306

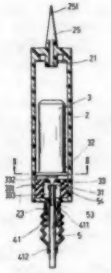
FLUID FLOW REGULATOR FOR INTRAVENOUS FEEDING DEVICE

Cheng-Kuo Fan, Kaohsiung, Taiwan, assignor to Liang-Jr Lee, Kaohsiung, Taiwan

Filed Mar. 19, 1986, Ser. No. 841,255

Int. Cl.[4] F16K *31/22, 33/00*

U.S. Cl. 137—390 **5 Claims**



1. A fluid flow regulator for intravenous feeding device comprising:

a cylindrical housing defining a liquid chamber having a top inlet end and a bottom tubular outlet end;

a resilient hollow sealing body fitted in the bottom part of the housing adjacent to the tubular outlet end, the body having a central through-hole therein directed from the chamber to the tubular outlet end, and an annular flange projecting toward the through-hole at the top side of the sealing body, the annular flange forming a valve seat;

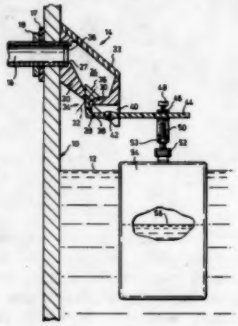
a float body disposed in the chamber and having a bottom plug portion to seat against the valve seat;

a tube inserted movably in the tubular outlet end for communicating the intravenous fluid flow, the top of the tube extending to the through-hole of the resilient body to communicate therewith; and

an elastic connecting sleeve having an upper end secured to the tubular outlet end and a lower end being directly

secured to the tube with said tube extending through said lower end, the elastic sleeve being extensible and retractable in an axial direction relative to the tubular outlet end as said tube moves in said axial direction.

4,640,307
FLOAT VALVE
Charles G. Roberts, Richmond, England, assignor to Roberts & Associates Water and Waste Treatment Limited, England
Filed Nov. 28, 1983, Ser. No. 555,690
Claims priority, application United Kingdom, Nov. 30, 1983, 8234090
Int. Cl.[3] F16K *31/22, 33/00*
U.S. Cl. 137—448 9 Claims



9. A float valve mechanism for a cistern or tank, said valve mechanism comprising in combination:

(a) a valve housing defining an enclosed chamber;

(b) an inlet port to said closed chamber adapted to be permanently connected to the inlet pipe to said cistern or tank;

(c) an outlet port from the chamber;

(d) a conical valve seat surrounding said outlet port said valve seat having a cone axis;

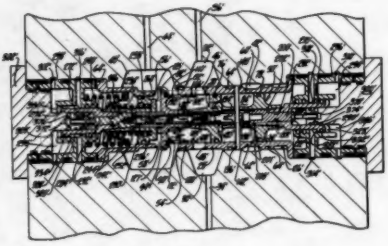
(e) a lever pivotally mounted on said housing for pivotal movement about a horizontal axis;

(f) a weighted float rigidly affixed to the lever at a location laterally spaced from said housing, and so as to extend below said lever, effective to cause the lever to pivot about said horizontal axis as the level of water or other liquid in said cistern or tank rises and falls;

(g) a valve member fixedly connected directly and rigidly to said lever and passing freely through said outlet port; and

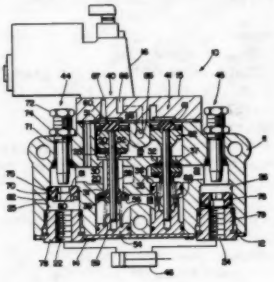
(h) a valve head on said valve member, said valve head being within said chamber and having a surface of cooperating conical shape to said conical valve seat, said valve head being positioned on said lever so as to be sealingly engageable around the full periphery of said valve head in said conical valve seat precisely at the moment when said valve head reaches a closed position of said valve, the valve head then having a portion fully within said closed valve chamber, said valve head pivoting as an integral unit with said lever, whereby said valve head moves along a circular path centered on a pivot of the lever and passing through said outlet port, the cone axis of the valve head and valve seat being tangent at all times to said circular path, whereby the conical surface on said valve head is effective, in said closed position to seal off water or other liquid flow from said chamber through said outlet port, the inlet pressure of said water or other liquid within said chamber acting on said portion of said valve head fully within said closed chamber to maintain the conical valve surface continuously in sealing contact with said conical valve seat until the turning moment of said weighted float about said horizontal axis exceeds the turning moment of the inlet pressure acting on said portion of said valve head.

4,640,308
FLUID CONTROL VALVE
Alvin D. Toelle, Fenton, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Jul. 25, 1984, Ser. No. 634,255
Int. Cl.[4] F16K *11/14*
U.S. Cl. 137—596.18 23 Claims



1. A fluid flow control valve comprising a valve housing means having a bore with a fluid inlet means, fluid outlet means and fluid drain means in fluid flow communication therewith, a valve means slidably disposed in said bore, said valve means having fluid metering valve means slidable therewith for metering fluid flow between said fluid inlet means and fluid outlet means, fluid shut-off valve means slidable therewith for terminating fluid flow to said fluid outlet means and further having a longitudinal valve bore in fluid flow communication with said fluid outlet means and said fluid drain means, drain valve opening means disposed in fixed position in the valve bore, and a fluid drain valve means in the valve bore movable with the valve means for opening by the drain valve opening means when fluid flow to said fluid outlet means is terminated by said shut-off valve means so that fluid can drain from said fluid outlet means to said fluid drain means through the valve bore and closeable during metered fluid flow to the fluid outlet means past said metering valve means, and means for sliding said valve means to control fluid flow.

4,640,309
PILOT OPERATED POPPET VALVE WITH SPEED CONTROL
Robert K. Hoffman; Mark A. Kavanaugh, both of Plainwell, and David C. Franson, Kalamazoo, all of Mich., assignors to Parker Hannifin Corporation, Cleveland, Ohio
Division of Ser. No. 508,785, Jun. 29, 1983, abandoned. This application Aug. 15, 1985, Ser. No. 766,668
Int. Cl.[4] E03B *7/07*
U.S. Cl. 137—596.18 3 Claims



1. A valve for controlling the flow of fluid to and from a load device, comprising

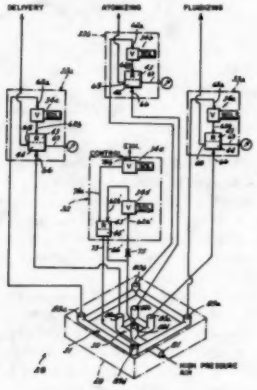
a valve body having pressure and exhaust chambers and an internal chamber therein,
a load port to which said load device is connected
a fluid passageway between said load port and said internal chamber,
a valve seal in said passageway reciprocable between first and second positions in response to fluid pressure at said port,
a valve stem in said passageway cooperable with said valve seal for restricting the flow of fluid through said passageway when said valve seal is in said first position therein and for allowing free flow when said valve seal is in said second position, and
a pilot operated poppet valve in said valve body for controlling the flow of fluid from said pressure chamber to said internal chamber and from said internal chamber to said exhaust chamber, for alternately pressurizing and exhausting said load device connected to said load port,
said poppet valve comprising a piston moveable in a piston bore and spaced valve seals movable with said piston and cooperable with spaced valve seats at ports connecting said internal chamber with said pressure and exhaust chambers,
said poppet valve further comprising a bumper seal for said piston, said bumper seal comprising an elastomeric disc having a raised edge for flexible sealing engagement with said piston bore and a raised central bumper portion for cushioning abutment with a closed end of said piston bore,
said valve stem and valve seal comprising a speed control valve with said valve seal being annular, having a seal at the periphery thereof and a central opening for fluid flow, said central opening being partly restricted by said valve stem when said valve seal is in said first position to limit the flow of fluid therethrough,
said valve stem being adjustably mounted in said valve body for movement toward and away from said central opening in said valve seal, for controlling the flow of fluid at said load port when said valve seal is in said first position.

4,640,310

VARIABLE AIR-PILOTED AIR REGULATOR SYSTEM

Ronald J. Hartle, Lorain, and Robert C. Hall, Strongsville, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Dec. 26, 1984, Ser. No. 686,206
Int. Cl.[4] F16K *11/20*
U.S. Cl. 137—883 **16 Claims**



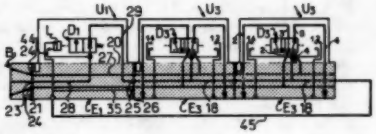
1. An apparatus for individually and independently setting the pressure of a plurality of air streams in a powder spray system having a fluidizing air stream, an atomizing air stream and a delivery air stream, comprising:
a control regulator,
means for selectively setting the output pressure of said control regulator,
first, second and third flow regulators, each flow regulator being operable to control the pressure of one of said fluidizing, atomizing and delivery air streams,
pressure setting means selectively interconnecting said control regulator to each of said first, second and third flow regulators for individually setting the pressures of said first, second and third flow regulators independently of one another.

4,640,311

MODULAR SYSTEM OF DISTRIBUTION

Roland Martinet, Blois, and Alain Casas, Vineuil, both of France, assignors to Climax France S.A., France

Continuation of Ser. No. 407,053, Aug. 11, 1982, abandoned. This application Jul. 12, 1985, Ser. No. 754,465
Claims priority, application France, Aug. 14, 1981, 81 15778
Int. Cl.[4] F15B *13/07*
U.S. Cl. 137—884 **11 Claims**



1. A modular system for the distribution of a pressure fluid connected to a pressure fluid supply system and to a driving device adapted to receive said fluid, said modular system comprising:
at least one main unit (U_3) comprising a distributor (D_3) and a base plate (E_3) provided with a mounting face, said base plate ensuring the connection of said distributor to said driving device and to said fluid supply system, said distributor being mounted interchangeably by means of a mounting face on said mounting face of said base plate,
said distributor mounting face and said base plate mounting face comprising the same configuration of registering orifices of supply connectable to said fluid system, of outlet for the distribution of the pressure fluid to said driving device, of discharge and of control, said distributor being switchable between two positions for establishing predetermined connections between said distributor mounting face supply and outlet orifices,
said base plate (E_3) comprising a front and a rear connecting face provided respectively with the same configuration of two discharge orifices and one pressure fluid orifice which is an inlet orifice in the front face and an outlet orifice in the rear face, said base plate (E_3) having external orifices connectable to said driving device and additionally comprising internal passageways connecting said pressure fluid inlet orifice of said front connecting face to said pressure fluid outlet orifice of said rear connecting face and to said pressure fluid supply orifice of said base plate mounting face, for connecting each one of the two discharge orifices of said front connecting face to one corresponding discharge orifice of said rear connecting face and to one corresponding discharge orifice of said base plate mounting face and for connecting each one of said outlet orifices of said base plate mounting face to said external orifices connectable to said driving device;
at least one auxiliary unit (U_1) mounted upstream in series with said main unit (U_3) to constitute a progressive starter, said auxiliary unit (U_1) comprising a distributor (D_1) and a base plate (E_1) provided with a mounting face, said distributor (D_1) being mounted interchangeably by means of a mounting face on said mounting face of said auxiliary unit base plate, said auxiliary unit base plate (E_1) compris-

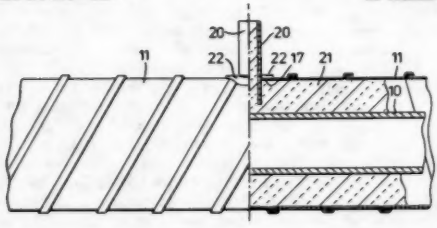
ing front and rear connecting faces provided for the connection of said auxiliary unit (U_1) to said main unit (U_3) and to said fluid supply system, said front and rear connecting faces of said auxiliary unit base plate having the same configuration of two discharge orifices and one pressure orifice which is a pressure inlet orifice in the front face and an outlet pressure orifice in the rear face, each one of said front connecting face discharge orifices being directly connected through internal passageway to a corresponding rear connecting face discharge orifice, wherein the improvement consists in that said auxiliary unit distributor (D_1) is of the same type as the main unit distributor (D_3), whereas the auxiliary unit base plate differs from the one of the main unit, and in that said auxiliary unit base plate mounting face comprises a first pressure fluid orifice communicating with said pressure inlet orifice of said front connecting face of said auxiliary unit base plate (E_1), a second orifice and a third calibrated orifice provided with a nozzle, these two orifices communicating with the outlet pressure orifice of the rear connecting face of said auxiliary unit base plate, each of said auxiliary unit base plate mounting face orifices being in a registering relationship with an auxiliary unit distributor mounting face orifice, and said two orifices are alternately connectable through communication of said auxiliary distributor to said pressure fluid orifice of said auxiliary unit base plate mounting face, the auxiliary unit distributor mounting face orifices without registering auxiliary unit base plate mounting face orifice being obturated by said auxiliary unit base plate mounting face, said three orifices of said auxiliary unit base plate mounting face being so arranged that the auxiliary unit distributor (D_1) connects the first orifice either to the second orifice or to the third, calibrated orifice, depending on its switching position.

4,640,312

PREFABRICATED THERMALLY INSULATED PIPELINE SECTION

Farrokh A. Patell, Cheltenham, and Stephen E. McConkey, Islington, both of Canada, assignors to Shaw Industries Ltd., Rexdale, Canada

Filed Dec. 13, 1984, Ser. No. 681,277
Claims priority, application Canada, Dec. 22, 1983, 444038
Int. Cl.[4] F16L 9/22
U.S. Cl. 138—109 **21 Claims**



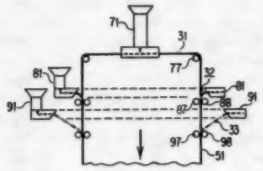
20. A prefabricated thermally insulated pipeline section comprising an outer tubular casing, a pipe disposed within and in spaced relationship to the inner surfaces of the casing, a one piece cast thermally insulative liner disposed between the casing and the pipe and comprising particles of lightweight expanded aggregate in a foamed, cured, and dried portland cement binder, the liner bonding to the inner surfaces of the casing and having an inner annular surface closely conforming to and in disjunction from the exterior surface of the pipe, so that the pipe reciprocates relative to the casing and liner without disrupting the material of the liner, and a cylindrical sleeve bonded to the inner surface of each end of the liner and extending axially inwardly from said end of liner and circumferentially around the pipe with sufficient clearance to permit rotational and axial movement of the pipe relative to the sleeve.

4,640,313

INTERLINING OF PIPELINES FOR TRANSPORTING SEWAGE, WATER, SLURRIES, LIQUID AND GASEOUS HYDROCARBONS, AND THE LIKE

Robert K. Stanley, 698 Geneva Pl., Tampa, Fla. 33606

Filed Dec. 19, 1983, Ser. No. 563,065
Int. Cl.[4] B29C 67/22, 47/06; F16L 55/18; E21D 11/00
U.S. Cl. 138—141 **20 Claims**



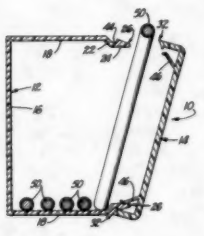
1. In preparing for lining a pipe with composite tubular materials fitting thereinto and having an inner skin layer and contiguous expansible layer, the improvement comprising extending the skin layer biaxially at least about 2X before juxtaposing the expansible layer into lateral contiguity therewith.

4,640,314

ENCLOSED CONDUIT

Donald E. Mock, San Dimas, Calif., assignor to Kirkhill Rubber Company, Brea, Calif.

Filed Jul. 23, 1984, Ser. No. 633,638
Int. Cl.[4] F16L 9/22
U.S. Cl. 138—162 **2 Claims**



1. An enclosed conduit having a base of uniform cross-sectional configuration throughout its length, said base including opposed sides terminating in spaced, parallel edge walls and having a cover of uniform cross-sectional configuration throughout its length, said cover enclosing the space between said edge walls of said base and having spaced parallel edge walls located so as to extend along the sides of said edge walls of said base which are remote from one another, both said edge walls of said base and of said cover including coacting means for securing said cover in place, said coacting means enabling said cover to be snapped onto and off of said base in which the improvement comprises:

said coacting means on both said base and on said cover each including a sloping wall leading to a catch surface, both of said catch surfaces being shaped so as to permit said cover to be snapped onto said base with adjacent catch surfaces on the exterior of said edge walls of said base facing outwardly, generally away from one another and with said catch on said edge walls of said cover extending generally towards one another;

auxiliary retainer walls for inhibiting the deflection of said sides of said base located on said cover adjacent to and spaced from each of said edge walls of said cover, each of

said auxiliary retainer walls having a terminal end which extends parallel to an adjacent edge wall of said cover and extends diagonally from said cover generaly towards said auxiliary retainer wall terminal end so as to inhibit the deflection on the sides of said base when said cover is located on said base by engaging the side walls of said base;

said coacting means and said auxiliary walls being of such a configuration as to serve as a pivot structure such that an edge wall of said cover can be rotated relative to the outer edge wall of said base adjacent to it while the other edge wall of said cover is engaged with the outer edge wall of said base adjacent to it so as to serve as a pivot structure such as to permit limited rotation of said cover relative to said base so as to be in a partially open position;

said edge walls of said base are separated from the remainder of said base by offsets;

said edge walls of said cover appear as extensions of said sides of said base and are spaced from said offsets by gaps, said gas being sufficiently large to receive a manipulative tool used to deform said base to the extent necessary to release said cover;

said auxiliary walls fit internally of said edge walls of said base so as to make it relatively difficult to move said sides of said base so as to disengage said catch surfaces.

4,640,315

PROJECTILE WEAVING MACHINE

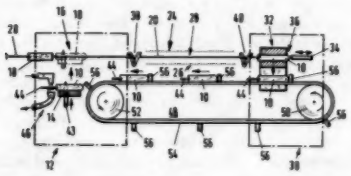
Lorant Gacsay, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 2, 1985, Ser. No. 803,716

Claims priority, application Switzerland, Dec. 18, 1984, 05990/84

Int. Cl.[4] D03J *1/00*; D03D *47/24*

U.S. Cl. 139—1 C **12 Claims**



1. A projectile weaving machine comprising

a picking mechanism for picking a projectile with a weft yarn therein through a shed;

a catcher for receiving a picked projectile;

a projectile return conveyor for returning a projectile from said catcher to said picking mechanism;

a cutting means adjacent said catcher for severing a weft yarn end at said catcher; and

a pneumatic means for removing a severed weft yarn end from a projectile, said pneumatic means including a suction tube for drawing a severed weft yarn end thereinto and a blowing nozzle for blowing a stream of air through an opened projectile aligned with said suction tube to blow a severed weft yarn end into said suction tube.

4,640,316

FLOW VELOCITY DISTRIBUTION DETECTING SYSTEM

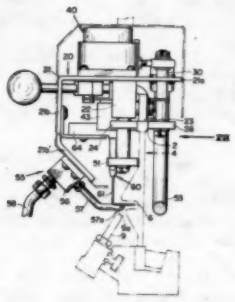
Shinzi Wakai, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 6, 1986, Ser. No. 816,743

Claims priority, application Japan, Jan. 17, 1985, 60-4848; Jan. 21, 1985, 60-7422; Jan. 29, 1985, 60-13472

Int. Cl.[4] D03J *1/00*

U.S. Cl. 139—1 R **29 Claims**



1. A system in combination with an air jet loom including means for defining a plurality of grooves on front side of a reed, said grooves being aligned in direction of weft picking to form an air guide channel, and auxiliary nozzles for ejecting air into said air guide channel,

said system comprising:

a rail disposed parallel with said reed and extending in the weft picking direction;

a carrier engageable with said rail and movable along said rail;

means for maintaining said carrier in a predetermined posture; and

a flow velocity detector for detecting the flow velocity of air flowing through said air guide channel, carried by said carrier and including a flow velocity sensing section located in said air guide channel.

4,640,317

WOVEN STRAPS WITH TRANSVERSE CONTRACTIONS

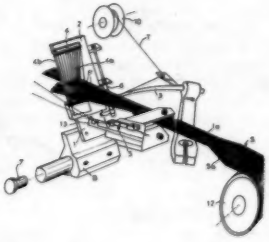
Georges Chardon, Saint-Etienne, and Andre Chomienne, Saint-Chamond, both of France, assignors to Faure Roux, Saint Chamond, France

Filed Oct. 31, 1984, Ser. No. 666,910

Claims priority, application France, Nov. 3, 1983, 8317761

Int. Cl.[4] D03D *47/42*

U.S. Cl. 139—431 **6 Claims**



1. A method of weaving straps having a rectilinear portion and a transverse constricted portion, on an automatic sickle loom having a slay and a knitting needle, the needle being fixed

against displacement transverse to the straps, the method comprising the steps of:

guiding warp yarns for the strap through a V-shaped support reed having converging blades, the support reed being positioned angularly on the slay of the loom in an oblique manner relative to the knitting needle, so as to maintain an edge of the reed in a plane parallel to the needle;

imparting a displacement to the support reed in said plane parallel to the needle to thereby cause the warp yarns to be spaced further from one another and to be brought nearer to one another during weaving while maintaining the endmost yarn in said fixed plane parallel to the needle; and,

synchronizing and controlling the vertical displacement of the support reed with variation of weft feeding speed, strap tension and slay-striking stress, for production of said constricted portion and said rectilinear portion, respectively.

4,640,318

CATCHER FOR A WEAVING MACHINE

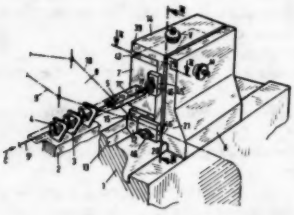
Otto Hintsch, Wallisellen, and Hanspeter Ernst, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 18, 1985, Ser. No. 810,879

Claims priority, application European Pat. Off., Jan. 24, 1985, 85100679.1

Int. Cl.⁴ D03D *47/24*

U.S. Cl. 139—439 **4 Claims**



1. In a weaving machine having a guide channel for picking of a projectile therethrough, the combination comprising

a catcher having a braking channel for receiving a projectile from said guide channel;

a holder slidably receiving said catcher therein for movement transversely relative to said braking channel;

a slide slidably receiving said holder therein for movement transversely relative to said braking channel and said holder; and

a support slidably receiving said slide for movement parallel to said guide channel and said braking channel.

4,640,319

AUTOMATIC TIE GUN

John G. Walker, Hamble, England, assignor to Bowthorpe-Hellermann Limited, Crawley, England

Continuation of Ser. No. 351,997, Feb. 24, 1982, Pat. No. 4,495,972, which is a continuation-in-part of Ser. No. 236,583, Feb. 20, 1981, abandoned, and a continuation-in-part of Ser. No. 236,584, Feb. 20, 1981, abandoned. This application Jan. 28, 1985, Ser. No. 695,699

Claims priority, application United Kingdom, Feb. 27, 1980, 8006529; Feb. 26, 1981, 8106130; Sep. 21, 1981, 8128479

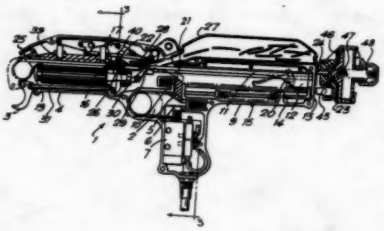
Int. Cl.⁴ B21F *09/02*

U.S. Cl. 140—93 A **4 Claims**

1. In a combination for automatically applying an individual flexible tie from a supply of individual interconnected flexible ties around an elongate bundle of wires, each of the ties having a tie body portion having a flat tail portion and an operational head portion at opposite ends of said tie body, said combination including a tool and said supply of interconnected flexible ties, the improvement comprising:

a series of individual flexible ties assembled in the form of a belt of ties wherein the ties are disposed side-by-side in a flat plane and in generally parallel alignment with each other, said individual flexible ties being interconnected successively with one another in a predetermined spacing by integral flexible bridging portions adjacent the head and tail portions of individual ties so as to form a tie supply bandolier wherein the ties are in generally parallel alignment with each other and in generally perpendicular relation to the axes defined by the integral flexible bridging portions adjacent said tie head and tail portions, said briding portions at said head and tail portions cooperating to maintain adjacent ties in said generally parallel alignment and maintain said predetermined spacing of adjacent ties for preventing relative movement of adjacent ties and facilitating receipt of adjacent ties onto a tie tool indexing means; and

a tie tool adapted to receive individual ties from said tie



supply bandolier, said tie tool including indexing means for receiving said individual ties from said tie supply bandolier in said predetermined spacing, cropping means for cutting the individual ties free from the bridging portions adjacent the tie head and tail portions to separate said individual ties from said tie supply bandolier for use in said tie tool, removal means operatively associated with said cropping means for receiving and transmitting to waste said bridging portions which have been severed from said individual ties, driving means operatively associated with said indexing means for driving each individual tie so separated around said elongate bundle, guide means at the one end of said tool which directs each individual tie so separated from said bandolier around said elongate bundle in a manner by which said tie tail passes through said apertured head to interlock therein, means for engaging said free end of said tie tail (once passed through said apertured head) and driving it lengthwise of itself to tension the tie around said bundle being tied, and a knife for cutting the tail behind said tie head and tension-sensing means for actuating said knife when a predetermined tension in said tie is reached.

4,640,320

AUTOMATIC TIE GUN

Gerald Avison; John W. Teape, and Paul H. F. Willer, all of Cambridge, England, assignors to Bowthorpe-Hellermann Limited, Crawley, England

Filed Sep. 18, 1984, Ser. No. 651,873

Claims priority, application United Kingdom, Sep. 20, 1983, 8325138; May 9, 1984, 8411828

Int. Cl.⁴ B21F *9/02*

U.S. Cl. 140—93 A **24 Claims**

1. An automatic tie gun for applying a flexible one-piece plastic cable tie around an elongate bundle of cables, each tie

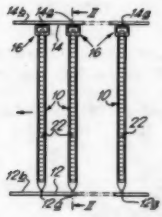
having a tie body which includes a tail and apertured head at opposite ends of said tie, comprising:

means for advancing a single tie into a tail-forward, tie driving position within said gun;

means for driving said single advanced tie tail-first from said gun and around said cable bundle;

guide means at the forward end of said gun for guiding the tie tail of said driven tie around the cable bundle such that the free end of said tie tail is spaced apart from said tie head aperture and aligned with said tail head aperture;

means for threading said tie tail of said driven tie while held in said guide means into and through said tie head aperture



in interlocking engagement therewith, said threading means being adapted for reciprocatable movement, whereby said tie head is displaced onto said tie tail by the first movement of said threading means and the second reciprocal movement of said threading means carries the interlocked tie head and tail in a direction opposite that of said first movement, and

a rotatable wheel for tensioning said driven tie around said cable bundle, said rotatable wheel being adapted to engage said tie tail free end, said second movement of said threading means carrying said free end of said tie tail into engagement with said rotatable tensioning wheel.

4,640,321

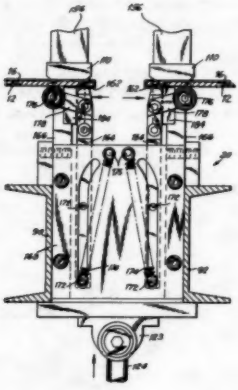
WIRE BEND MACHINE

LeRoy M. Varga, Dover, and Michael F. Yermal, Wharton, both of N.J., assignors to Rockaway Corporation, Rockaway, N.J.

Filed Aug. 16, 1985, Ser. No. 766,882

Int. Cl.⁴ B21F *27/14*

U.S. Cl. 140—93 C **30 Claims**



1. Apparatus for processing a series of sequentially arranged container blanks each having a plurality of sequentially arranged spaced mats, said blanks having gaps therebetween and being connected by a plurality of binding wires, said blanks having first and second sides and end edges facing each other at said gaps, said wires being located along said first side thereof; said apparatus comprising a frame defining a path of travel therethrough for the container blanks, means for driving said container blanks along the path of travel to a wire manipulating position, and for stopping movement of the blanks with a gap therebetween at said wire manipulating position, means for cutting the binding wires at said gap in the wire manipulating position to form cut wire sections, means for bending the cut wire sections through 90° perpendicular to the first side of the blanks and over said facing edges thereof; means for wiping the thus bent cut wire sections through another 90° bend toward and generally parallel to the second side of its associated mat, and means for clinching the bent cut wire sections into the second sides of their associated mats.

4,640,322

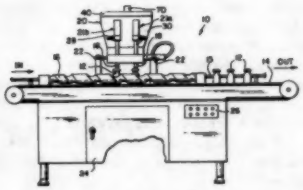
METHOD AND APPARATUS FOR FILLING A RECEPTACLE WITH A MATERIAL

Edwin Ballester, Babylon, N.Y., assignor to Cozzoli Machine Co., Plainfield, N.J.

Continuation-in-part of Ser. No. 746,363, Jun. 19, 1985, abandoned, which is a continuation of Ser. No. 537,266, Sep. 29, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 814,314

Int. Cl.⁴ B65B *1/38, 3/14*

U.S. Cl. 141—5 **20 Claims**



20. A method of automatically filling receptacles with powder substantially free of contaminants, comprising the steps of:

(a) containing the powder in a hopper;

(b) constantly openly communicating an inlet of an upright measuring chamber with the hopper;

(c) positioning an outlet of the chamber above successive receptacles each in their respective turn;

(d) mounting a porous filter within, and extending across, an upper region of an internal elongated passageway provided in the chamber, said filter being operative for resisting passage of powder therethrough;

(e) mounting a discharge valve within a lower region of the passageway;

(f) moving the valve between open and closed positions in which the valve respectively permits and obstructs communication between the passageway and the outlet, said valve in the closed valve position extending across the lower region remote from the filter and bounding therewith an internal cavity;

(g) suddenly conveying a mass of the powder from the hopper through the inlet and into the cavity when the valve is in the closed valve position, said cavity being substantially closed to the ambient environment exteriorly of the apparatus to resist powder contamination during charging of the cavity; and

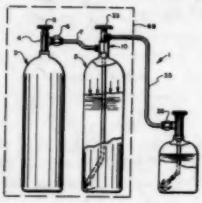
(h) suddenly conveying the mass of the powder en masse from the cavity through the outlet and into each respectively positioned receptacle to fill each receptacle when the valve is in the open position, said cavity being substantially closed to the exterior ambient environment to resist powder contamination during filling of each receptacle.

4,640,323

PORTABLE SYSTEM FOR FILLING BOTTLES WITH NITROUS OXIDE

John A. Norcia, Columbia; Ray Bickar, Blythewood, and William M. Wheatley, Elgin, all of S.C., assignors to Ram Automotive Company, Columbia, S.C.

Filed Sep. 27, 1985, Ser. No. 784,672
Int. Cl.[4] B65B 3/10
U.S. Cl. 141—18 **15 Claims**



1. A portable system for filling bottles with nitrous oxide including:

(a) a first container holding a supply of pressurized liquid nitrous oxide;

(b) a second container holding a supply of pressurized inert gas under a greater pressure than the nitrous oxide;

(c) a third container for receiving a supply of liquid nitrous oxide from said first container;

(d) first conduit means for delivering nitrous oxide from the first container into the third container;

(e) second conduit means for delivering pressurized inert gas from the second container into the first container to form a pressurized blanket of inert gas against the liquid nitrous oxide for discharging the nitrous oxide from said first container and into the third container through the first conduit means; and

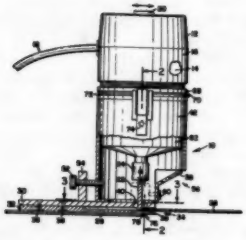
(f) valve means for directing the flow of pressurized inert gas into the first container through the second conduit means to form the pressurized blanket of inert gas and for directing the nitrous oxide from said first container and into the third container through the first conduit means, wherein said valve means is a two-position valve which enables the first container to be alternatively connected to the second and third containers through the second and first conduit means, respectively.

4,640,324

ROUTER ATTACHMENT

Bernard C. Lounds, P.O. Box 403, Holt, Mich. 48842

Filed Sep. 12, 1985, Ser. No. 775,376
Int. Cl.[4] B27C 5/10
U.S. Cl. 144—134 D **16 Claims**



1. A router attachment, comprising:

a generally planar top plate having a clearance hole therein;

a generally planar bottom plate secured in predetermined vertically spaced-apart relationship with the top plate to define a generally horizontal slot therebetween for receiving a first sheet of material to be cut;

means for adjustably securing a router and bit in inverted relationship to said top plate over the clearance hole therein; and

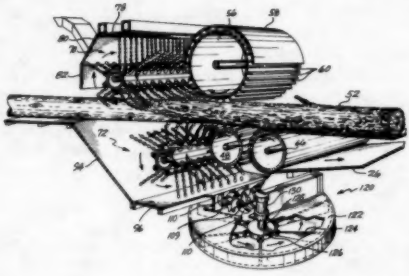
a rotatable cam mounted in said bottom plate beneath the clearance hole in said top plate, said cam including an offset depending cam follower mounted for movement therewith for engaging an edge of a second sheet of material.

4,640,325

FLAIL MEMBER FOR DEBARKING TREES

Dennis H. Vaders, Plymouth, N.C., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 5, 1984, Ser. No. 678,309
Int. Cl.[4] B27L 1/00
U.S. Cl. 144—208 J **5 Claims**



1. A flail member of the type useful in a debarking system for removing bark from logs as the logs travel relative to the flail member through a debarking station, having the improvement comprising:

a plurality of laterally spaced chain segments mounted on a rotatable member with the segments being arranged in a plurality of rows, and

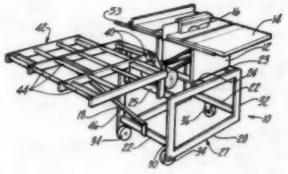
at least some of the chain segments having different lengths thereby defining means providing a different lateral vibratory frequency upon impact with the logs.

4,640,326

STAND FOR A TABLE SAW

Timothy W. Hewitt, 18 Kensington, Pleasant Ridge, Mich. 48069

Filed Jan. 24, 1985, Ser. No. 694,603
Int. Cl.[4] B25H 1/00
U.S. Cl. 144—287 **5 Claims**



1. A stand for a table saw having a work support surface, said stand comprising,

a generally rectangular frame having a top, bottom, two

spaced sides and two spaced ends, constructed from rigidly connected elongated framing members,

a pair of elongated supports which angle outwardly away from said frame,

means securing said supports to one end of said frame so that said supports are spaced apart and parallel to each other and so that one end of each support is spaced above said top and is spaced outwardly from said one end by a predetermined distance,

a planar platform having a plurality of spaced rollers,

means pivotally securing said platform to said ends of said supports, said platform being pivotal between an upper position in which an upper surface of each roller is substantially coplanar with said work support surface and a lower position in which said platform is substantially flush against said end of said frame, and

means connecting said frame and said platform for locking said platform in said upper position,

wherein said supports are rigidly secured to at least one of said members at the top of said frame.

4,640,327

ULTRA HIGH PRESSURE WATER LOG DEBARKING

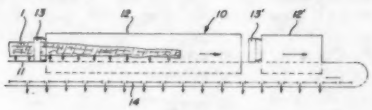
Alexandre Krilov, New South Wales, Australia, assignor to The Minister for Industry and Decentralization of the State of New South Wales, Sydney, Australia

Filed Mar. 25, 1985, Ser. No. 715,937

Claims priority, application Australia, Oct. 17, 1984, PG7689

Int. Cl.[4] B27L *3/00*

U.S. Cl. 144—340 **2 Claims**



1. A method of hydraulically debarking logs, comprising the step of directing water generally radially onto the surface of a log to be debarked at a substantially constant ultra high pressure of at least 25,000 kPa.

4,640,328

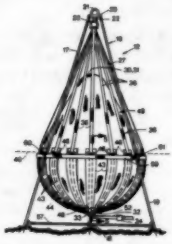
COLLAPSIBLE LIQUID CONTAINER PARTICULARLY FOR TRANSPORTATION BY HELICOPTER

Donald B. Arney, 1001 - 2191 W. 39th Ave., Vancouver, B.C., V6M 1T7, Canada

Filed May 16, 1984, Ser. No. 610,831

Int. Cl.[1] B65D *90/12;* **B64D** *37/04*

U.S. Cl. 150—55 **14 Claims**



1. A flexible fully collapsible and emptyable fluid container apparatus for aerial transport or the like comprising:

(a) a collapsible container having a first upper portion and a second lower portion and a third central portion;

(b) ground engageable support means for supporting said container;

(c) said first upper portion of said container having a first collapsed position when said container is empty and a second expanded position when said container is full;

(d) said second lower and said third central portions having a substantially bowl-like configuration at all times;

(e) said support means including rigid means engageable with said third central portion for maintaining said second lower and said third central portions in said bowl-like configuration at all times;

(f) said first upper position of said container including means for permitting said first upper portion to collapse fully into said bowl-like configuration of said second lower and said third central portions whereby, when said first upper portion is fully collapsed into said second central and said third lower portions, said container is fully emptied and said fully collapsed position can be observed by visual inspection to confirm full drainage of fluid in the container;

(g) said ground engageable support means includes three legs;

(h) said rigid means connects said three legs together; and,

(i) harness means cooperating with said container and said ground engageable support means to suspend the container from the support means.

4,640,329

RADIAL TIRE FOR MOTORCYCLES

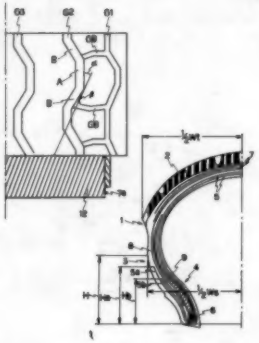
Eiji Nakasaki, Kakogawa; Hisashi Shirashoji; Katsuyuki Hoshikawa, both of Kobe; Takao Kamijo, Toyonaka; Kazushige Ikeda, Akashi; Yasuhiro Inoue, Himeji, and Takeo Kato, Nishinomiya, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Aug. 13, 1984, Ser. No. 640,270

Claims priority, application Japan, Aug. 11, 1983, 58-147458

Int. Cl.[4] B60C *11/06, 9/20*

U.S. Cl. 152—209 R **6 Claims**



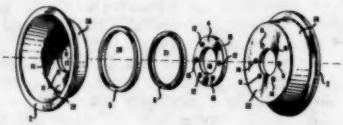
1. A tire for motorcycles comprising a tread portion, side wall portions extending inwardly from the both ends of said tread portion in the radial direction, bead portions positioned at the radially inward ends of said side wall portions, a toroidal carcass composed of cords which extend approximately parallel with each other in the radial direction of the tire and of which the both end portions are turned up around bead cores, and a breaker arranged on the radially outer side of said carcass so that the cords thereof are extended at an angle of 5° to 35° to the circumferential direction of the tire, said thread portion having in its surface a plurality of zigzagged-longitudinal grooves which extend in the circumferential direction of the tire and each elemental groove of said zigzagged-longitudinal grooves is arranged at an angle of at least 5° with respect to the cord extending direction of the most outer ply of said breaker.

4,640,330

SEAL DEVICE FOR CENTRAL SECTIONS OF WHEEL HALVES

James J. Frassica, 5 Essex Pl., Chelmsford, Mass. 01824

Filed Jan. 31, 1985, Ser. No. 697,065
Int. Cl.[4] B60B *3/08*
U.S. Cl. 152—404 2 Claims



1. A wheel comprising:

first and second generally cup shaped wheel halves having a center section, an integral rim section, and a central opening in said center section, said wheel halves being disposed with their central sections facing each other and parallel throughout their entire length,

means forming an air-tight seal between the wheel halves center sections such that the sealing means is sandwiched between the center sections and in contact with the surfaces of both center sections wherein said means comprises an inner ring, an outer ring coaxially disposed about said inner ring, the outer diameter of the inner ring being smaller than the inner diameter of the outer ring and an O-ring positioned in the space between the inner and outer rings, both said inner and outer rings being separate from the wheel halves, and

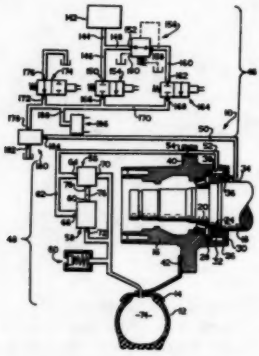
means for connecting the wheel halves together and compressing the O-ring.

4,640,331

CENTRAL TIRE INFLATION SYSTEM

Eugene R. Braun, Royal Oak, and Gary R. Schultz, Novi, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 4, 1984, Ser. No. 617,644
Int. Cl.[4] B60C *23/10, 29/00*
U.S. Cl. 152—417 23 Claims



1. A vehicle onboard tire inflation system comprising:

control means for selectively pressurizing and exhausting a first conduit;

a pressure relief valve having a first port for fluid connection to said first conduit, a second port for fluid connection to atmosphere and a third port connected to a second conduit; said pressure relief valve automatically responsive to fluid pressure in said first and second conduits and effective to establish fluid flow between said first and second conduits and to block said second port if the pressurization in said first conduit is equal to or greater than the pressurization in said second conduit, and to establish fluid flow between said second conduit and said second port and to block said first port if the pressurization in said second conduit is greater than the pressurization in said first conduit;

tire valve means rotatably mounted to an inflatable tire and having a fourth port for fluid connection to said second conduit and a fifth port fluidly connected with the interior pressurized chamber of said tire, said tire valve means automatically responsive to pressurization of said second conduit and of said interior pressurized chamber to establish and block fluid communication between said fourth port and said fifth port;

said tire valve means effective to establish fluid communication between said fourth port and said fifth port when said second conduit is pressurized to a pressure greater than a predetermined first reference pressure and said interior pressurized chamber is pressurized to a pressure equal to or greater than a minimum tire reference pressure;

said tire valve effective to establish fluid communication between said fourth and fifth ports, when the pressure in said interior tire chamber exceeds a maximum tire pressure reference value;

said tire valve effective to block communication between said fourth and fifth ports when the pressure in said second conduit does not exceed said first reference pressure and the pressure in said interior tire chamber does not exceed a predetermined maximum tire reference pressure; and

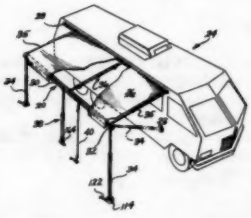
said tire valve effective to block fluid communication between said fourth and fifth ports if said interior chamber of said tire is pressurized to a pressure less than said minimum tire reference pressure value regardless of the magnitude of pressure in said second conduit.

4,640,332

AWNING SUPPORT ASSEMBLY

Joe D. Turner, 2807 W. Prairie Creek, Richardson, Tex. 75080

Filed Jul. 29, 1985, Ser. No. 760,322
Int. Cl.[4] E04F *10/06*
U.S. Cl. 160—46 27 Claims



1. A support assembly for an awning apparatus adapted for attachment to a supporting structure and capable of retraction, the awning apparatus including a support tube, and a canopy having a first edge portion securable to the support tube, the canopy being windable about the support tube, said support assembly comprising:

(a) means for supporting the awning apparatus; and

(b) means for attaching said supporting means to the awning apparatus, said attachment means comprising;

(i) first and second clamping members, each having a hook-shaped distal end portion adapted for engagement within a corresponding opening in the support tube, and a longitudinal portion extending generally circumferentially about a portion of the support tube;

(ii) means for adjustably interconnecting the longitudinal portions of the clamping members of said attachment means into taut condition relative to the support tube

with the end portions of the clamping members engaged within a corresponding support tube opening; and,

(iii) means for interconnecting said supporting means with said attaching means.

4,640,333

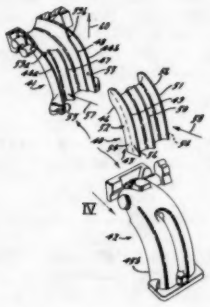
FOAM PATTERN ASSEMBLY FOR USE IN EVAPORATIVE CASTING PROCESS

Robert A. Martin, Northville, and Thomas J. Heater, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 5, 1985, Ser. No. 772,817

Int. Cl.⁴ B22C *7/02*

U.S. Cl. 164—246 **9 Claims**



1. A complex consumable foam pattern assembly for use in an evaporative pattern metal casting process, comprising:

(a) mating first and second clamshell-shaped foam members, said first and second foam members meeting along exteriorly exposed joint margins defined by mateable surfaces extending along opposite sides of each of said members;

(b) at least one other foam member nestable totally within the mated assembly of said first and second members and nestable without joint margins exposed to the exterior of said assembly;

(c) surface means enclosed within said mated assembly for piloting said first, second and other members into mating relationship; and

(d) adhesive means bonding said first and other members together and said second member to the assembly of said first and other member.

4,640,334

APPARATUS FOR CASTING MATERIALS FOR FALSE TEETH

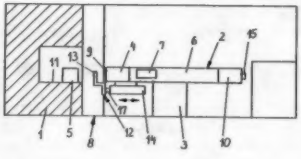
Rudi Koerner, Elisabethenstrasse 41, D-7080 Aalen-Unterkochen, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,667

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1984, 3445424

Int. Cl.⁴ A61C *13/20*; **B22D** *13/00, 13/10*

U.S. Cl. 164—287 **11 Claims**



1. An apparatus for casting materials for false teeth, especially gold, from a melt receptacle into a muffle preheated in a preheater furnace, wherein said melt receptacle together with the muffle attached thereto by a connecting means is disposed on a centrifugal arm of a centrifugal device that rotates during a casting operation, wherein said preheater furnace (1) and said connecting means (9,13) are situated upon a common structural unit (8) so close to each other that to convey said muffle (5) and fasten it on said connecting means there is provided an actuable manipulator arm (12) which carries out only one shifting movement in one plane and which engages said muffle.

4,640,335

CASTING APPARATUS

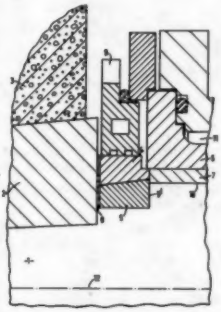
Peter J. Clark, Cannock; Anthony W. Hudd; Stephen T. Bloor, both of Sutton Coldfield, all of England, and Erling Roller, Essen, Fed. Rep. of Germany, assignors to IMI Refiners Ltd., Walsall, England

Filed Jan. 18, 1985, Ser. No. 692,543

Claims priority, application United Kingdom, Jan. 25, 1984, 8401976

Int. Cl.⁴ B22D *11/10*

U.S. Cl. 164—440 **9 Claims**



1. Apparatus for the continuous casting of metal, comprising:

a horizontally-oriented mould having in inner perimetrically-extending mould surface extending longitudinally from a mould entrance end;

said mould including means for cooling said mould surface so as to cause molten metal to solidify thereagainst while travelling longitudinally of said mould from said mould entrance end;

a feed means adapted to pass molten metal from a container towards said entrance end of said mould for supplying said mould with molten metal;

a perimetrically-extending composite sleeve sealingly interposed axially between said feed means and said mould at said entrance end of said mould so that molten metal flowing from said feed means into said mould through said entrance end of said mould, must flow through said composite sleeve;

said composite sleeve including a perimetrically-extending inner portion made of graphite and having a perimetrically-extending inner surface defining at least part of a conduit between said feed means and said mould;

said composite sleeve further including a perimetrically-extending outer portion engagingly surrounding said inner portion, said outer portion being made of thermal insulating material;

said inner portion of said composite sleeve, immediately adjacent said entrance end of said mould, about all of the periphery of said inner surface of such composite sleeve inner portion, being of such lesser transverse extent from a notional longitudinal centerline of said mould surface, that an abrupt, downstream-facing annular shoulder is

formed on said inner portion of said composite sleeve, which annular shoulder extends effectively between said inner surface of said inner portion of said composite sleeve, and said mould surface at said entrance end of said mould.

4,640,336

REFRACTORY FOR CONTINUOUS CASTING

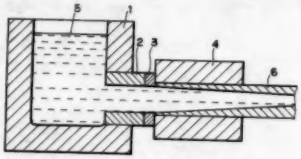
Kazumi Arakawa; Toshiyuki Hirao; Kenji Sugiura; Satoshi Kuroki, all of Kariya; Sei Hiraki; Takao Suzuki, both of Amagasaki, and Ken Nakai, Ibaragi, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed Sep. 24, 1985, Ser. No. 779,417

Claims priority, application Japan, Mar. 11, 1985, 60-47846; Oct. 1, 1985, 59-205966

Int. Cl.⁴ B22D *11/10, 41/02*

U.S. Cl. 164—440 **10 Claims**



1. A refractory article for connecting a mold and a tundish in continuous casting, said refractory article containing silicon aluminum oxynitride produced by heating an admixture consisting essentially of:

1–80 wt. % aluminum nitride,

1–50 wt. % boron nitride,

1–30 wt. % clay mineral, and

the remainder being silicon nitride,

said clay mineral containing alumina, silica and an alkali component, whereby said silica and alumina react with said aluminum nitride and said silicon nitride to produce the silicon aluminum oxynitride and said alkali component reacts with said silicon nitride to produce a glass phase within the refractory.

4,640,337

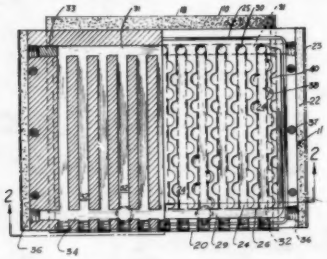
CONTINUOUS CASTING APPARATUS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed May 1, 1985, Ser. No. 729,246

Int. Cl.⁴ B22D *11/124*

U.S. Cl. 164—443 **9 Claims**



1. A continuous casting apparatus comprising

a coolant body having an elongated opening into one end of which molten metal is introduced and out of the other end of which solidified metal is removed,

said body having an outer surface,

a plurality of grooves on said outer surface defining spaced ribs,

a plate closing said grooves to define axial passages between the ribs,

an inlet in said coolant body for supplying coolant communicating with said axial passages,

an outlet in said coolant body for removing coolant communicating with said axial passages such that coolant flows continuously through said axial passages,

said ribs having side walls,

said ribs having longitudinally spaced oppositely facing recess in said side walls defining a radial enlargement whereby coolant moving along said axial passages is subjected to a turbulent flow, said recesses are substantially cylindrical in a direction transverse to the ribs,

said recesses on one side of one rib being staggered longitudinally with respect to the recesses on the adjacent side of the adjacent rib such that the coolant is subject, in addition, to a sinuous flow from a recess in one side wall of one rib to a recess of an opposite side wall of an adjacent rib.

4,640,338

ROLLER APRON FOR CASTING OF SUPPORT-PRE-PROFILES OR SECTIONAL SHAPES AND BLOOMS IN A CONTINUOUS CASTING INSTALLATION

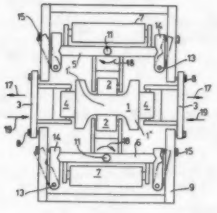
Ken Kumagai, Niihama, Japan, assignor to Concast AG, Zürich, Switzerland

Filed Oct. 2, 1980, Ser. No. 193,357

Claims priority, application Japan, Oct. 22, 1979, 54-146204

Int. Cl.⁴ B22D *11/128*

U.S. Cl. 164—448 **4 Claims**



1. A roller apron for the continuous casting of I-shapes and blooms in a continuous casting installation, comprising:

a movable roller support member having two sides; a roller member for guiding a web portion of an I-shape mounted at one side of the roller support member; and

a further roller member for guiding a bloom arranged at the other side of said roller support member.

4,640,339

APPARATUS FOR CARRYING OUT PHYSICAL AND/OR CHEMICAL PROCESSES, MORE SPECIFICALLY A HEAT EXCHANGER OF THE CONTINUOUS TYPE

Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil B.V., Amsterdam, Netherlands

Division of Ser. No. 629,810, Jul. 11, 1984, Pat. No. 4,567,940. This application Jan. 15, 1986, Ser. No. 819,297

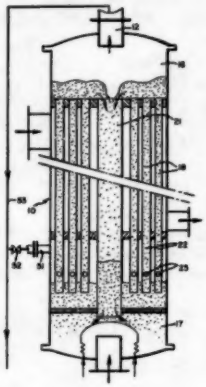
Claims priority, application Netherlands, Jul. 22, 1983, 8302622

Int. Cl.⁴ F28C *3/16;* **F28D** *13/00*

U.S. Cl. 165—1 **3 Claims**

1. Method of operation of apparatus for carrying out physical and/or chemical processes, in particular a heat exchanger of the continuous type, comprising a bundle of parallel vertical riser tubes, an upper chamber, a lower chamber, an upper pipe plate and a lower pipe plate for open connection of the pipe bundle to the upper and lower chambers respectively, a granu-

lar mass that can be kept in a fluidised condition at least in the riser tubes by a fluid medium flowing during operation upwardly through the lower chamber, the riser tubes and the upper chamber, a distribution plate for the granular mass in the lower chamber and at least one return tube with outlet below the distribution plate for return of an overflow of granules above the upper pipe plate from the upper chamber to the lower chamber, wherein each riser tube is provided with an



inflow pipe element extending into the lower chamber from the lower pipe plate to a level above the distribution plate through which the return tube or tubes projects or project, and the lower chamber is provided with a device that prevents granules from reaching the lower chamber inlet for the fluid medium at standstill characterised in that the fluid medium pressure at the top of the lower chamber is temporarily reduced.

4,640,340

HEATED OR COOLED STEERING WHEEL

Kazushi Noda, Inazawa; Moriyuki Komatsu, Nagoya, and Hiroshi Mitsunaga, Hirakata, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Matsushita Electric Industrial Co., Ltd., Kadoma, both of, Japan

Filed Oct. 18, 1984, Ser. No. 663,978

Claims priority, application Japan, Oct. 21, 1983, 58-197894

Int. Cl.[4] F25B *21/02*

U.S. Cl. 165—41 **7 Claims**

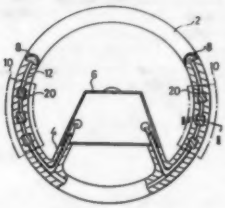
1. Apparatus for heating and cooling a steering wheel, comprising:

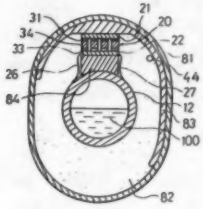
skin layer means adapted to form an outer surface of said steering wheel;

heat conductive means, connected to an inside surface of said skin layer means, for transferring heat to and from said skin layer;

thermal storage means, adapted to extend along a central portion of said steering wheel, for storing thermal energy;

thermoelectric transducer means, thermally coupled to said heat conductive means and said thermal storage means, for generating and absorbing thermal energy, said transducer means including first and second heat generating-/absorbing contact portions adapted to generate and absorb heat in accordance with an electric current supplied thereto, said first contact portion being thermally coupled to said heat conductive means, and said second contact





portion being thermally coupled to said thermal storage means.

4,640,341

RADIATOR FOR VEHICLES, HAVING IMPROVED MOUNTABILITY INTO VEHICLES

Motoo Ozawa, Iruma, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Apr. 17, 1984, Ser. No. 601,289

Claims priority, application Japan, Apr. 19, 1983, 58-69034; Apr. 21, 1983, 58-70723

Int. Cl.[4] F01P *11/08*

U.S. Cl. 165—41 **1 Claim**

1. A radiator for use in a vehicle having a vehicle body, a water-cooled engine mounted in said vehicle body at a central location thereof, said enging having at least one cylinder projected toward a central portion of said radiator, said radiator being adapted to radiate the heat of hot cooling water from said engine, said vehicle body including a cooling fan disposed to direct air to said central portion of said radiator, said radiator comprising:

a plurality of radiator-forming elements juxtaposed and joined to each other,

each element being formed of a pair of half elements joined together in an abutting manner, each half element having:

a partition wall extending along an axis of said half element from a first end portion thereof to a point in the vicinity of a second end portion thereof,

a substantially U-shaped groove extending around said partition wall, and

a flange formed along an outer peripheral edge of said half element;

each pair of half elements being joined together along said partition walls and said flanges thereof,

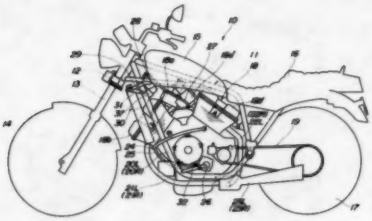
the partition walls and flanges of the half elements of each elements being aligned with each other so that a substantially U-shaped heat radiating passage is defined within the element,

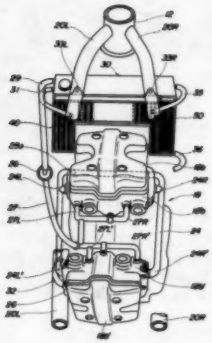
said plurality of radiator-forming elements thus containing a corresponding plurality of U-shaped heat radiating passages juxtaposed to each other,

the parts of said radiator-forming elements positionally cor-

responding to said central portion of said radiator being shorter in length than the other parts of said radiator-forming elements, whereby said radiator assumes a substantially U-shaped configuration adapted to avoid interference of said radiator with said at least one cylinder;

a water distributing chamber disposed at the first ends of said passages and communicating therewith, said water distributing chamber being supplied with cooling water and distributing the cooling water into said passages; and





a water collecting chamber disposed at the second ends of said passages and communicating therewith, said water collecting chamber being supplied with cooled water from said passages;

said U-shaped heat radiating passages extending in substantially the same direction as each other, such that said water distributing chamber and said water collecting chamber are closely juxtaposed to each other.

4,640,342

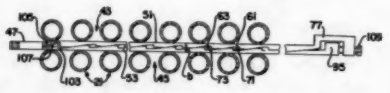
EXPANDABLE ANTIVIBRATION BAR FOR HEAT TRANSFER TUBES OF A PRESSURIZED WATER REACTOR STEAM GENERATOR

Robert H. Appleman, Pleasant Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1984, Ser. No. 574,304

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—69 **16 Claims**



9. In a pressurized water reactor steam generator having a plurality of spaced rows of heat transfer tubes through which primary coolant from the reactor flows, the tubes being of a U-shaped design, with the U-bend portions of the U-shaped tubes stabilized by antivibration bars, the improvement comprising:

a plurality of expandable antivibration bars for stabilizing the U-bend portions of said U-shaped tubes, said expandable bars having a pair of adjustable rods, formed from a pair of rod sections affixed to a connector, one rod section of each of said pair of rod sections having a plurality of protrusions, each of said protrusions having slidable surfaces thereon, and the other rod section of each of said pair of rod sections having a plurality of indentations, each of said indentations having slidable surfaces thereon complementary to the sliding surfaces of said protrusions, such that the rods are expandable from a first cross-sectional width less than the spacing between two adjacent rows of said tubes, to a second cross-sectional width greater than said first cross-sectional width, whereby said expanded rods are adapted to contact tubes of the two adjacent rows of said tubes.

4,640,343

TUBE-IN-SHELL HEAT EXCHANGERS

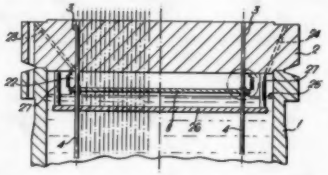
Guy L. Dearden, Rochdale, and Owen Hayden, Bolton, both of England, assignors to National Nuclear Corporation Limited, London, England

Filed Sep. 12, 1984, Ser. No. 649,669

Claims priority, application United Kingdom, Sep. 28, 1983, 8325948

Int. Cl.[4] F28F *11/00*

U.S. Cl. 165—70 **12 Claims**



12. In a tube-in-shell heat exchanger having a casing closed at its ends by main tube plates to define a shell through which a first heat exchange fluid is conducted for contact with the exterior of heat exchanger tubes extending through the shell and the main tube plates and sealingly secured to the main tube plates for conducting another heat exchange fluid through the heat exchanger, the improvement comprising at least one secondary tube plate within the shell and adjacent to but spaced from at least one of said main tube plates, each tube extending through the secondary tube plate and being sealingly secured thereto as well as being sealingly secured to the main tube plate, the secondary tube plate being sealed in its spaced position by a bellows sealingly secured to both the main and the secondary tube plates and disposed so as to envelope the said tubes, with the secondary tube plate unsecured to the shell of the heat exchanger, said bellows being of substantially thinner and more flexible construction than either of said main and secondary tube plates.

4,640,344

SELF-CLEANING, ROTARY HEAT EXCHANGER

Milton F. Pravda, Towson, Md., assignor to Manco Corporation, Walla Walla, Wash.

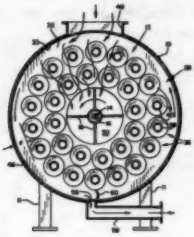
Filed Mar. 4, 1986, Ser. No. 836,064

Int. Cl.[4] F28D *5/00*

U.S. Cl. 165—86 **16 Claims**

16. In a rotary, Perkins tube heat exchanger, a case located in the fluid flow boundary layer surrounding the rotor, purge port means in the case, and airfoil means extending inwardly

from the case into the fluid flow boundary layer and operative to cause local turbulent fluid flow therein, as well as to divert

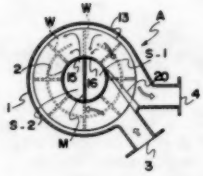


a predetermined portion of the fluid flow out through the purge port means.

4,640,345
ROTATING HEAT EXCHANGER

Jinichi Nishimura, 584-8 Ohaza Ushizu, Ushizu-machi, Ogi-gun, Saga, Japan

Filed Oct. 1, 1984, Ser. No. 656,225
Int. Cl.[4] F28F 5/02; F28D 11/02
U.S. Cl. 165—92 **4 Claims**

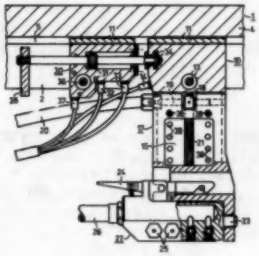


1. A heat exchanger comprising:
(a) a hollow drum through which a heating or heated medium can be circulated,
(b) means rotably mounting said hollow drum within an outer casing, inlet means for introducing fluid into said outer casing,
(c) an outlet means for discharging said fluid after being heated from said outer casing,
(d) a plurality of hollow and disc-like projections mounted on the outer peripheral surface of said hollow drum,
(e) first partition means dividing the interior of said hollow drum into supply and discharge passages,
(f) a supply port for each projection at said peripheral wall of said hollow drum communicating with said supply passage and a discharge port for each projection at said peripheral wall of said hollow drum communicating with said discharge passage, whereby said heating medium supply and discharge passages each communicate with the interior of hollow portions of said projections,
(g) second partition means within each of said hollow disc-like projections between a supply port and a discharge port thereof for directing fluid around the interior of said projection from said supply port to said discharge port, said second partition means comprising a solid radial wall disposed between said supply port and said discharge port, said solid radial wall defining a C-shaped fluid passage in said disc-like partition and
(h) a plurality of perforated radial walls disposed in said C-shaped fluid passage in a circumferentially spaced-apart manner, said each perforated radial wall having a multiplicity of small communicating apertures through which said fluid passes and circumferential wall disposed within said C-shaped fluid passage dividing said flow passage into inner and outer flow passages.

4,640,346
TUBE LANE MANIPULATOR FOR THE HIGH-PRESSURE BLOW-DOWN OF HEAT EXCHANGERS

Robert Weber, Uttenreuth, and Josef Forster, Bubenreuth, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,713
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3512100
Int. Cl.[4] F22B 37/52
U.S. Cl. 165—95 **4 Claims**

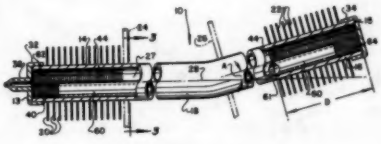


1. Tube lane manipulator for the high-pressure blow-down of heat exchangers with tubes spaced apart by a given tube pitch, comprising a guide rail extended along the tube lane having a vertical leg with holes formed therein at mutual spacings substantially matched to the tube pitch; a stepping mechanism extended along and locked to said guide rail, said stepping mechanism including two stepping mechanism members, means for executing steps of a length substantially matched to the tube pitch, clamping feet in the form of posts, and means for extending said posts into said holes formed in said vertical leg for fixing said stepping mechanism members in a position provided by said steps; a spraying head carrier coupled to one of said stepping mechanism members, a spraying head holder, means for telescopically extending and guiding said spraying head holder along said spraying head carrier in a direction perpendiculer to said guide rail, and a spraying head with at least one spraying nozzle disposed on said spraying head holder.

4,640,347
HEAT PIPE

George M. Grover, and Robert H. Chrisman, both of Los Alamos, N. Mex., assignors to Q-dot Corporation, Garland, Tex.

Filed Apr. 16, 1984, Ser. No. 600,478
Int. Cl.[4] F28D 15/00
U.S. Cl. 165—104.26 **7 Claims**



1. A heat transfer device comprising:
a tubular member closed at both ends to form an enclosed chamber for containing a quantity of working fluid operable to be in a liquid state and a vapor state at the working

temperature of the device, said tubular member having a generally horizontally extending evaporator section at a first end and a condenser section at a second end in spaced relationship to the first end, said condenser section forming an angular extension upwardly of the evaporator section, a flow separator means for dividing the tubular member into adjust passage surrounded by a second passage, the first passage being formed a distance of not less than 90% of the inner dimension of the tubular member from the tubular member's first and second closed ends for open communication with the second passage, said first passage having an inner dimension defining the cross section of said flow path at least 45% of the inner dimension of the said tubular member, said first passage operative to pass working fluid in the vapor state from the evaporator section into the second passage at the condenser section for condensation to the liquid state and return through the second passage to the evaporator section whereby during operation of said heat pipe heat is transferred between said sections.

4,640,348

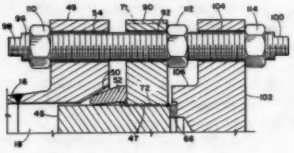
DUAL PURPOSE CLOSURE FOR HEAT EXCHANGERS

W. F. Roberts, 4731 S. Columbia Pl., Tulsa, Okla. 74105

Division of Ser. No. 641,865, Aug. 17, 1984, Pat. No. 4,564,065, which is a continuation-in-part of Ser. No. 551,573, Nov. 14, 1983, Pat. No. 4,570,701. This application Oct. 25, 1985, Ser. No. 792,278

Int. Cl.⁴ F28F *9/02*

U.S. Cl. 165—158 **4 Claims**



1. An end closure for a heat exchanger of the type having a shell side enclosure and at least one tube within said shell, the closure comprising a shell flange attached to the end of said shell, a tube sheet encompassing said tube and situated within said shell adjacent said end, said tube sheet having peripheral threads, a tubular connection and a tube flange for said tubular connection, said tube flange in facing alignment with said shell flange, a thrust flange positionable between said shell flange and said tube flange, said thrust flange surrounding said tube sheet and including inner peripheral threads for interconnection with said tube sheet threads, a plurality of axially aligned openings in said shell, tube and thrust flanges to receive connection bolts or studs to assemble said closure, an enlarged means on a plurality of said bolts or studs abuttable against said thrust flange, means to seal between said tube sheet and said shell flange, and means to seal between said tube flange and said tube sheet.

4,640,349

FLEXIBLE SUCKER ROD UNIT

Loy F. Allen, Odessa, Tex., assignor to Allen and Bennett, Inc., Odessa, Tex.

Filed Jun. 14, 1985, Ser. No. 745,285

Int. Cl.⁴ E21B *17/10*

U.S. Cl. 166—68.5 **5 Claims**

1. In a deep well having:

a. an eduction tube with an inside diameter extending from the surface of the earth to far below the surface,

b. a reciprocating pump housing attached to the bottom of the eduction tube,

c. pump jack means at the surface for reciprocating the pump,

d. a light sucker rod connected to the pump jack means and extending into the eduction tube, and

e. a series of heavy sinker bars having a large cross sectional area in the eduction tube connecting the light sucker rod to the pump;

f. an improved integral metal flexible rod unit interconnecting the sinker bars comprising in combination with the above:

g. a coupling on each end of the integral metal flexible rod unit connecting the flexible rod unit to the contiguous sinker bar,

h. a segment which is flexible as compared to the sinker bars connecting one of the couplings to

i. an integral metal bearing adjacent to the other of the couplings, the bearing having

j. a cylindrical surface with

k. a diameter

i. only slightly smaller than the inside diameter of the eduction tube thereby forming a sliding fit therewith, and

ii. greater than the diameter of any other portion of the flexible rod unit and the sinker bar, and

l. grooves in the cylindrical surface for the passage of fluid between in the eduction tube around the bearing.

4,640,350

KICKOVER TOOL

Neil H. Akkerman, Houston, and John P. Hare, Pearland, both of Tex., assignors to AVA International Corporation, Houston, Tex.

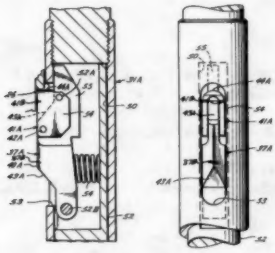
Filed Feb. 11, 1985, Ser. No. 700,821

Int. Cl.⁴ E21B *23/03*

U.S. Cl. 166—117.5 **3 Claims**

1. For use in running or pulling well tools respectively into or from a side pocket to one side of a bore through a mandrel of a well string, wherein there is a generally vertical slot in the bore of the mandrel which has a shoulder at its upper end and which has upwardly converging guide surfaces on its open lower end; a kickover tool comprising a housing connectible to a wire line for raising and lowering therewith closely through the upper end of the bore, an arm pivotally connected to the housing and having means on one end from which the well tool may be suspended, a plunger mounted in the housing for vertical reciprocation between an upper position in which the end of the arm is generally beneath housing to permit the kickover tool to move through the upper end of the mandrel bore, and a lower position in which the arm is tilted to dispose its end to one side of the housing, and means guidably movable into the

slot for rotationally orienting the end of the tilted arm into a position above the pocket, including a trigger mounted on the plunger for movement between an outer position with respect to the housing in which a portion of the trigger protrudes from the housing and an inner position with respect thereto in which the orienting means may move through the upper end of the mandrel bore, means yieldably urging the trigger toward its outer position, said trigger having a surface on the uppermost end of the protruding portion, and a key connected to the trigger to dispose its upper end directly above the said trigger surface, when the trigger is in its outer position, and thus to engage with the shoulder of the slot as the housing is raised to lift the orienting means into the slot, whereby the housing may



be raised further so as to lower the plunger and locate the end of the tilted arm above the pocket, and then lowered to permit said end of the arm to be connected to or disconnected from a well tool in the pocket, said connection of the key to the trigger being releasable when the housing is again raised to lift the upper end of the key into engagement with the shoulder of the slot and the housing is jarred upwardly, to permit the key to move to a lower position in which a downwardly and outwardly tapered surface on one of said trigger and key is slidable over the shoulder of the slot, as the housing is further raised, to force the orienting means into its inner position and thus permit it to be lifted through the upper end of the mandrel bore with the housing.

4,640,351

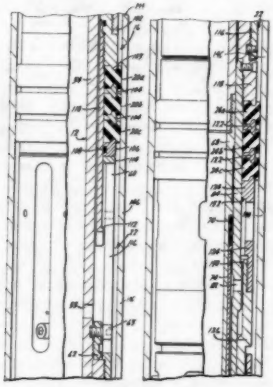
SEALING PACKER

Ted G. Clifton, Tulsa, and Robert L. Brookey, Jerks, both of Okla., assignors to Arrow Oil Tools, Inc., Tulsa, Okla.

Filed Oct. 2, 1985, Ser. No. 783,207

Int. Cl.[4] E21B *33/124*

U.S. Cl. 166—127 **5 Claims**



1. A sealing packer for a well casing characterized by:

a tubular inner sleeve with a passage therethrough;

an upper outer sleeve assembly mounted about said inner sleeve and including:

a resiliently deformable upper packing element;

seat means for seating said upper packing element;

hold down means for engaging a well casing and retaining said outer sleeve assembly stationary against upwardly directed well pressures;

a lower outer sleeve assembly slidably mounted about said inner sleeve and including:

a resiliently deformable lower packing element;

first seat means for seating said lower packing element;

abutment means for compressing said upper packing element between said abutment means and said seat of said upper outer sleeve assembly;

said upper packing element constructed such that when compressed it engages said well casing,

setting means for fixing a second seat means of said lower outer sleeve assembly relative to said well casing:

said lower packing element being deformable between said first and second seat means of said lower outer sleeve assembly to engage said well casing;

piston means normally adjacent said abutment means and separable therefrom, said piston means responsive to fluid pressure in said passage and in said well casing between said lower and upper packing elements when said packing elements deformably engage said well casing to separate from said abutment means and further deform said upper packing element; and

said tubular inner sleeve having a port for allowing fluid communication from said passage to a section of said well casing interposed between said upper and lower packing elements.

4,640,352

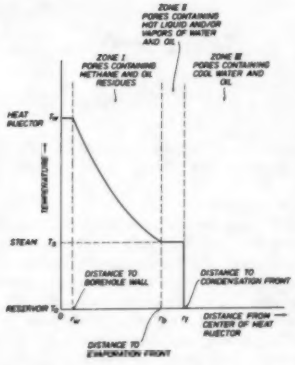
IN-SITU STEAM DRIVE OIL RECOVERY PROCESS

Peter Vanmeurs; Monroe H. Waxman, and Harold J. Vinegar, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 477,570, Mar. 21, 1983, abandoned, and a continuation-in-part of Ser. No. 609,605, May 14, 1984, abandoned. This application Sep. 24, 1985, Ser. No. 779,761

Int. Cl.[4] E21B *36/04, 43/24, 43/30*

U.S. Cl. 166—245 **20 Claims**



1. A process for heating a subterranean oil and water-containing reservoir formation, comprising:

completing at least one each of heat-injecting and fluid-producing wells into a treatment interval of said formation

which is at least about 100 feet thick, contains both oil and water, and is both undesirably impermeable and non-productive in response to injections of oil recovery fluids;

arranging said wells to have boreholes which, substantially throughout the treatment interval, are substantially parallel and are separated by substantially equal distances of at least about 20 feet;

in each heat-injecting well, substantially throughout the treatment interval, sealing the face of the reservoir formation with a solid material which is relatively heat-conductive and substantially fluid impermeable;

in each fluid-producing well, substantially throughout the treatment interval, establishing fluid communication between the wellbore and the reservoir formation and arranging the well for producing fluid from the reservoir formation; and

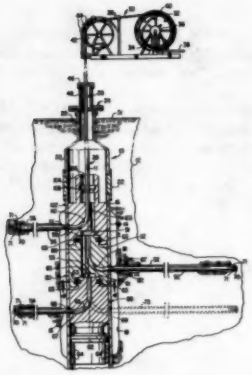
heating the interior of each heat-injecting well, at least substantially throughout the treatment interval, at a rate or rates capable of (a) increasing the temperature within the borehole interior to at least about 600° C. and (b) maintaining a borehole interior temperature of at least about 600° C. without causing it to become high enough to thermally damage equipment within the borehole while heat is being transmitted away from the borehole at a rate not significantly faster than that permitted by the thermal conductivity of the reservoir formation.

4,640,353

ELECTRODE WELL AND METHOD OF COMPLETION

Frank J. Schuh, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 21, 1986, Ser. No. 842,516
Int. Cl.[4] E21B *7/08, 7/18, 17/20, 36/04*
U.S. Cl. 166—248 **21 Claims**



1. A method of providing an electrode well for electrical resistance heating of a subterranean formation comprising the steps of:

drilling a well into said formation to form a wellbore;

inserting at least one electrode member comprising a length of metal electrode tube into said formation by extending said electrode tube from means located at the surface of said formation through said well and diverting said electrode tube generally radially outwardly with respect to the central longitudinal axis of said well at a predetermined position in said formation by axially moving said electrode tube into said formation, the penetration of said electrode tube into said formation being enhanced by hydraulic jetting action, including the pumping of fluid through said electrode tube to the distal end thereof, during said insertion;

anchoring said electrode tube in a portion of said well adjacent said formation; and

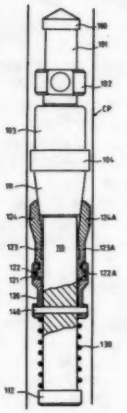
connecting said electrode tube to a source of electrical energy for resistance heating of said formation through electrically conductive contact of said electrode tube with said formation.

4,640,354

METHOD FOR ACTUATING A TOOL IN A WELL AT A GIVEN DEPTH AND TOOL ALLOWING THE METHOD TO BE IMPLEMENTED

Gérard Boisson, Melun, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,444
Claims priority, application France, Dec. 8, 1983, 83 19701
Int. Cl.[4] E21B *23/00, 33/132*
U.S. Cl. 166—250 **11 Claims**



1. A method for actuating a tool in a well at a chosen depth, comprising the following steps:

determining the temperature of the well at the chosen depth;

equipping the tool with a central element comprising a material capable of melting at a temperature near the temperature thus determined;

lowering the tool into the well to the chosen depth; and

maintaining the tool in the well at the chosen depth until actuation of the tool by the melting of the control element material.

6. A downhole tool designed to be actuated in response to the temperature of a well at a chosen well depth, comprising:

a body member adapted to be lowered into a well at the end of a cable;

energy storage means associated with said body member for storing energy in said tool prior to lowering said body member into said well; and

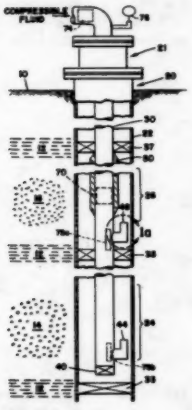
control means comprising a material that melts at a temperature near the temperature of said well at said chosen depth and cooperable with said energy storage means for releasing said stored energy to cause actuation of said tool.

4,640,355

LIMITED ENTRY METHOD FOR MULTIPLE ZONE, COMPRESSIBLE FLUID INJECTION

Ki C. Hong, Orange; Suzanne Griston, San Dimas, and Joseph W. Ault, Moraga, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 26, 1985, Ser. No. 716,292
Int. Cl.[4] E21B *36/00, 43/12, 43/18, 43/24*
U.S. Cl. 166—269 25 Claims



1. A method for injecting compressible thermal fluid at a constant injection rate into two or more producing zones of a formation through a single tubing string in an injection well comprising the steps of:

installing casing in said injection well having perforations at each of said producing zones;

installing a single tubing string in said injection well;

providing outlets in said tubing string at each of said producing zones;

packing off said single tubing string substantially adjacent to each of said producing zones;

insulating the single tubing string through the packed off producing zones to minimize heat transfer between fluid in the tubing string and fluid outside the tubing string; and

injecting compressible thermal fluid down said single tubing string at an injection pressure which will produce sonic flow of compressible fluid through said outlets of said tubing string.

6. A method for injecting compressible fluid at a constant injection rate into one or more producing zones of a formation through a single tubing string in an injection well comprising the steps of:

installing a single tubing string in said injection well;

providing outlets in said tubing string at each of said producing zones;

packing off said single tubing string substantially adjacent to each of said producing zones;

injecting compressible fluid down said single tubing string at an injection pressure which will produce sonic flow of compressible fluid through said outlets of said tubing string; and

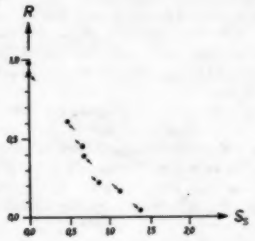
changing the size of said outlets thereby adjusting the constant injection rate.

4,640,356

PROCESS FOR THE ENHANCED OIL RECOVERY OF UNDERGROUND MINERAL OIL DEPOSITS

Zoltan Heinemann, Leoben, and Heinz König, Linz, both of Fed. Rep. of Germany, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Feb. 12, 1985, Ser. No. 700,630
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 3405201
Int. Cl.[4] E21B *33/138, 43/24*
U.S. Cl. 166—272 4 Claims



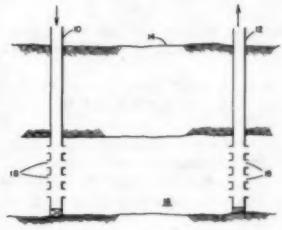
1. A process for the enhanced oil recovery of undergrcund mineral oil deposits by selective, reversible reduction of the permeability using hot water flooding at an injection temperature of 150° to 250° C. and/or steam flooding at an injection temperature of 200° to 350° C., wherein hot water and/or steam is injected, at least at times, into the deposit via one or more injection boreholes, as a flooding medium which contains an active amount of one or more substances scarcely oil-soluble at the temperature of the deposit and a water solubility of below 3 kg/m^3 water at 20° C. but well soluble or volatile in hot water and/or steam, the melting point of which lies above the temperature of the deposit and which moves with the hot water or the steam through the deposit and which, by precipitation as a solid in an amount of up to 4.3% of the pore volume, temporarily and reversibly constricts the pores of the deposit until flooding medium flowing on after dissolves or evaporates the solid again, which has the overall effect of an areal and vertical equalization of the temperature front.

4,640,357

MULTISTEP METHOD FOR VISCOUS HYDROCARBON RECOVERY

Lloyd G. Jones, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 11, 1985, Ser. No. 774,631
Int. Cl.[4] E21B *43/16*
U.S. Cl. 166—273 7 Claims



1. A method for recovering hydrocarbons from a fractured or stratified subsurface formation penetrated by at least one injection well and at least one production well, comprising the steps of:

(a) injecting a first flooding agent having an organic thickener into said formation only in the near vicinity of the injection well to form a filtercake on the walls of the fractures or permeable streaks of said formation,

(b) injecting a second flooding agent having an inorganic thickener deep into said formation to fill the thief zones provided by the fractures or permeable streaks between the injection and production wells,

(c) injecting a first flushing agent into said formation only in the near vicinity of the injection well to clear the fractures or permeable streaks in the near vicinity of the injection well of said inorganic thickener,

(d) injecting a second flushing agent having a breaker material into said formation only in the near vicinity of the injection well to remove the filtercake from the walls of the fractures or permeable streaks only in the near vicinity of the injection well,

(e) injecting a third flooding agent into said formation to flood said formation through the open pore space made available by the removal of the filtercake from the walls of the fractures or permeable streaks in the near vicinity of the injection well, and

(f) recovering hydrocarbons from the formation by way of the production well.

4,640,358

OIL RECOVERY PROCESS EMPLOYING A COMPLEXED POLYSACCHARIDE

Krishnaswamy Sampath, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 593,464, Mar. 26, 1984, abandoned. This application May 17, 1985, Ser. No. 735,002

Int. Cl.[4] E21B *43/22*

U.S. Cl. 166—274 **14 Claims**

1. In a method wherein a fluid medium is introduced into a borehole in the earth and into contact with a subterranean formation penetrated by said borehole, the improvement wherein at least a portion of said fluid medium comprises an aqueous gel and wherein said gel comprises water having incorporated therein:

a water thickening amount of a member selected from the group consisting of titanium ion and chromium ion complex of a fungal polysaccharide, having a linear chain of anhydroglucose units linked beta 1–3 with 30–35% of the linear chain units and bearing single appended anhydroglucose units linked beta 1–6, said complex being prepared by forming a water solution of the polysaccharide and adding thereto a water soluble reducing agent and a water soluble member selected from the group consisting of titanium compounds and chromium dichloride to form said complex.

4,640,359

BITUMEN PRODUCTION THROUGH A HORIZONTAL WELL

Declan B. Livesey, Calgary, and Petre Toma, Edmonton, both of Canada, assignors to Texaco Canada Resources Ltd., Calgary, Canada

Filed Nov. 12, 1985, Ser. No. 797,354

Int. Cl.[4] E21B *43/24, 36/00*

U.S. Cl. 166—276 **10 Claims**

1. Method for thermal stimulation and production of a viscous hydrocarbon from a reservoir having a productive layer which retains the hydrocarbon until the latter is made flowable by contact with a hot stimulating medium, which method includes the steps of;

forming a borehole having a substantially horizontal segment which transverses the productive layer,

registering a well completion in said borehole which includes;

an elongated perforate well liner, a fluid conduit extending through said liner and having a discharge end, and a well head at the liner upper end communicated with said fluid conduit,

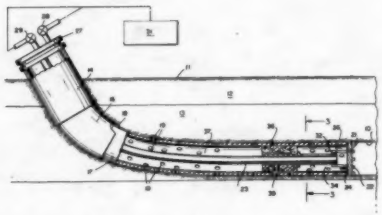
positioning a variable length flow diverter in said liner adjacent to the fluid conduit discharge end, whereby to define a quasi-barrier in said liner which is pervious to passage of the hot stimulating medium, and which divides the liner into injection and production segments respectively,

heating the productive layer about the substantially horizontal segment of said elongated liner,

introducing a pressurized stream of the hot stimulant through said fluid conduit and into the liner injection segment, and

producing hydrocarbon emulsion which flows into the liner production segment,

progressively extending the length of the variable length flow diverter to maintain the volume of the liner injection segment, and to concurrently decrease the volume of the liner production segment.



6. The combination with a well completion for a borehole formed in a generally horizontal disposition into a formation having a hydrocarbon productive layer comprised at least in part of sand particles which retain the said hydrocarbon in viscous form of;

a liner registered in said generally horizontal borehole having a perforated wall, and a well head, and a remote end,

a fluid carrying conduit in said liner communicated to a source of a hot stimulating fluid and with said well head, and having a discharge opening adjacent to the liner remote end for conducting a hot stimulating fluid flow to said liner remote end,

a variable length flow diverter bed positioned on said fluid carrying conduit to define a quasi-barrier to passage of said fluid therethrough, whereby to permit a limited flow of stimulating fluid into said barrier while diverting a major portion thereof through the liner perforated wall and into the hydrocarbon productive layer.

4,640,360

SONIC CEMENTING

Albert G. Bodine, and James N. Gregory, both of 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Oct. 21, 1985, Ser. No. 789,447

Int. Cl.[4] E21B *33/14*

U.S. Cl. 166—286 **4 Claims**

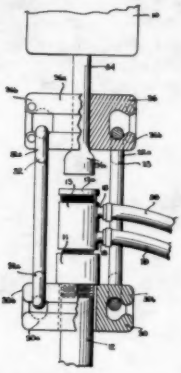
1. In a device for forming a cement annulus around the outer wall of a well casing, said device including means for generating sonic energy and a well casing to which said sonic energy is to be fed to effect a sealing bond between the cement and the casing, the improvement comprising means for coupling the sonic energy from a sonic generator to the casing comprising

inlet means attached to the casing for feeding cement and other material into the casing,

first holder means connected to the sonic energy generating means,

second holder means connected to the casing at a point thereon below the inlet means, and

link means for interconnecting said first and second holder means such that the sonic energy is fed directly from the



oscillator through said holder and link means to the casing and bypassing the inlet means.

4,640,361

THERMALLY RESPONSIVE AQUEOUS SILICATE MIXTURES AND USE THEREOF

William H. Smith, Walters, and Edward F. Vinson, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 13, 1985, Ser. No. 808,576
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—288 20 Claims

1. A method of plugging or sealing a zone in a subterranean formation comprising:

(a) contacting said zone with an aqueous silicate composition consisting essentially of

(i) an aqueous solution containing an alkali metal silicate; and,

(ii) a thermally responsive gelation activator selected from the group consisting of lactose, dextrose, fructose, galactose, mannose, mantose, xylose and mixtures thereof; and

(b) activating said gelation activator in response to a thermal change in said composition within said formation whereby said silicate composition is caused to form a gel in said zone.

4,640,362

WELL PENETRATION APPARATUS AND METHOD

Herman J. Schellstede, 342 Duperier Ave., New Iberia, La. 70560

Filed Apr. 9, 1985, Ser. No. 721,848
Int. Cl.[4] E21B *43/112, 7/18*
U.S. Cl. 166—298 50 Claims

1. A well penetrator for use in a well having a casing, said penetrator comprising:

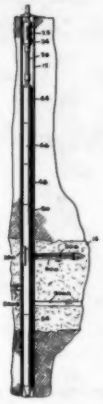
(a) an elongated housing having an upper end and a lower end, said upper end being connectable to surface mounted supporting means and said housing being dimensioned and shaped so as to be capable of being moved axially in the casing of a well;

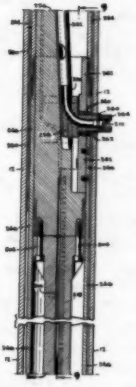
(b) an outwardly movable punch member having an inner end and an outer end, said outer end including casing cutting means for cutting an opening in a casing when moved forcefully against such casing;

(c) guide means supporting said punch member for movement relative to said elongated housing between a retracted position in which said outer end of said punch member is positioned substantially within the confines of said elongated housing and an extended position in which said outer end of said punch member is positioned outwardly from said carrier body;

(d) said elongated housing and said punch member being dimensioned and shaped so that said punch means can be positioned within a well casing for movement therein when said punch means is in its retracted position but wherein said outer end of said punch means extends outwardly beyond the outer surface of said casing when said punch member is in its extended position;

(e) power actuated punch drive means for moving said





punch member between its retracted and extended positions; and

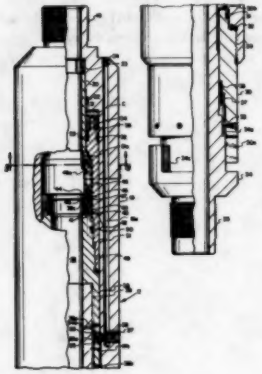
(f) high pressure liquid jet providing means including a source of high pressure working fluid connecting to nozzle means mounted for movement in said punch member between a retracted position in which said nozzle means is positioned internally of said punch member and an extended position in which said nozzle means is positioned externally of said punch member for discharging a high pressure jet outwardly beyond the outer end of said punch member for cutting and removing the surrounding earth formation.

4,640,363

BLEEDOFF TOOL FOR WELL TEST SYSTEM

Frank H. Taylor, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 12, 1985, Ser. No. 764,391
Int. Cl.[4] E21B *34/12*
U.S. Cl. 166—317 10 Claims



1. A bleedoff tool, connectable in pipe and having a longitudinal flow passage comprising:

(a) a piston;

(b) a body, including upper and lower bodies rotatably mounted and sealed around and releasably pinned to said piston;

(c) means for limiting body rotation relative to said piston to less than one turn;

(d) pressure balanced areas on the piston for preventing extension of said piston from said body;

(e) bearing means for minimizing relative rotational friction between the body and piston;

(f) closed flow passage means, openable on relative rotation betwen the body and piston to permit flow from the longitudinal flow passage to exterior of the tool;

(g) valve means in the longitudinal flow passage positioned open to permit two-way flow therethrough, said valve means releasable on a relative rotation between the body and piston to close and permit upward flow through said flow passage;

(h) means positioning said longitudinal flow passage valve means open; and

(i) friction means for transmitting torque through the tool.

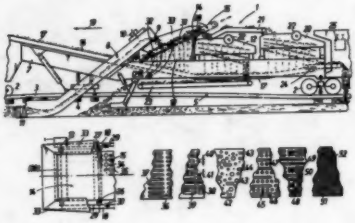
4,640,364

BALLAST CLEANING MACHINE WITH PRELIMINARY SIFTING CONVEYOR

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Sep. 17, 1984, Ser. No. 651,253
Claims priority, application Austria, Nov. 4, 1983, 3904/83
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] E01B *27/04, 27/02;* A01D *17/04;* B07B *9/00*
U.S. Cl. 171—16 14 Claims

1. A ballast cleaning machine capable of receiving ballast including a waste component from the track, cleaning the received ballast and conveying the ballast, which comprises a machine frame, a ballast excavating and conveying chain mounted on the machine frame, the chain having a discharge end for the excavated and conveyed ballast, ballast screening apparatus arranged to receive the ballast from the discharge end of the chain and to separate the waste component from the clean ballast, a conveyor band system mounted below the screening apparatus for receiving the clean ballast component and redistributing it to the track, and an endless conveyor band mounted below the screening apparatus for receiving and conveying the waste component, wherein the improvement comprises an endless sifting conveyor band mounted between the discharge end of the chain and the screening apparatus, the sifting conveyor band having an upper stringer receiving the excavated and conveyed ballast from the discharge end and defining openings permitting a portion of the waste component



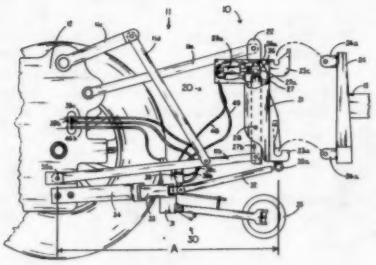
of said ballast to pass through the sifting conveyor band, the sifting conveyor band being mounted directly above the endless conveyor band whereby the endless conveyor band receives the waste component from the screening apparatus and the portion of the waste component passing through the sifting conveyor band, and a drive connected to the sifting conveyor band for driving the band whereby partially cleaned ballast is conveyed by the sifting conveyor band from the discharge end of the chain to the screening apparatus.

4,640,365

ROW FOLLOWING GUIDANCE DEVICE FOR A TRACTOR-DRAWN ROW CROP IMPLEMENT

Eugene H. Schmidt, P.O. Box 821, Lexington, Nebr. 68850

Filed Apr. 24, 1985, Ser. No. 726,802
Int. Cl.[4] A01B *69/06*
U.S. Cl. 172—26 19 Claims



17. A row following guidance device for a row crop implement drawn by a tractor with a hitch, comprising:

an "L"-shaped portion of an inverted "U"-shaped support means, having means for rigid attachment to the crop implement at one end of one leg of which "L"-shaped portion which leg extends horizontally at a right angle to the direction of travel, said "L"-shaped portion further having a leg depending from said one leg;

an extending support means aligned with the direction of travel and rigidly attached to said "L"-shaped portion at the juncture of its two legs, said support means extending outwardly from said "L"-shaped portion to a free end thereof;

a lever connected intermediate its ends, for pivotal rotation about a horizontal axis oriented transverse to the direction

of travel, to a point on the depending leg of said "L"-shaped portion near the lower end thereof, said lever having means for pivotal connection at its lower end to the trailing end of an arm of the tractor hitch and being pivotally connected at its upper end to the end of a horizontal tie rod which rotates about a vertical pin affixed to said "L"-shaped portion at a point thereon aligned with said means for attachment to the crop implement;

a hyraulic cylinder means pivotally connected at one end to said extending support means at a point thereon near its free end and pivotally connected at its other end to the horizontal tie rod near its connection to said lever; and

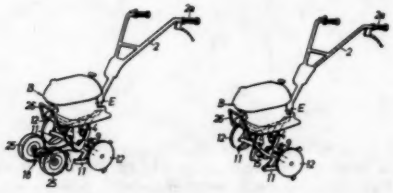
means for detecting lateral movement of the crop implement with respect to the crop rows and transmitting proportionate signals to a means for controlling said hydraulic cylinder, whereby the crop implement will be guided along a crop row independent of the relative lateral position of the tractor.

4,640,366

CULTIVATOR

Gunji Saito, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,953
Claims priority, application Japan, May 13, 1983, 58-83590
Int. Cl.[4] A01B *33/02, 33/08*
U.S. Cl. 172—42 **13 Claims**



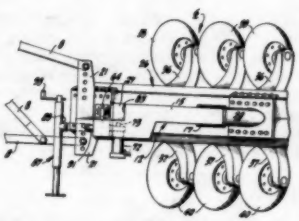
1. A rototiller-cultivator apparatus comprising a body portion, an engine mounted in said body portion, a transmission housing mounted on a bottom of said engine and extending vertically downward from said engine, a transmission shaft extending vertically downward from said engine through said transmission housing, said transmission shaft being coupled at its upper end to a crankshaft of said engine and mounted adjacent its lower end for rotation about a substantially vertical axis in said transmission housing, a cultivator tine shaft extending horizontally and laterally through the lower portion of said transmission housing, intermeshing gear means mounted on the lower end of said transmission shaft and on said cultivator tine shaft for driving said cultivator tine shaft when said transmission shaft is driven by said engine, cultivator tines mounted on opposite ends of said cultivator tine shaft for rotation with said cultivator tine shaft when said cultivator tine shaft is driven by said transmission shaft, a power take-off shaft mounted in the lower portion of said transmission housing transversely to said cultivator tine shaft and extending forwardly of said transmission housing with an output end of the power take-off shaft being protruded out of the housing, gear means mounted on said power take-off shaft and intermeshing with said gear means mounted on the lower end of said transmission shaft for driving said power take-off shaft when said transmission shaft is driven by said engine, and a wheel unit for mounting on said lower portion of said transmission housing for direct interconnection with the output end of said power take-off shaft when said apparatus is used as a cultivator, said wheel unit including a casing mounted on said lower portion of said transmission housing over the output end of said power take-off shaft and extending forwardly therefrom transversely to said cultivator tine shaft, a wheel drive transmission shaft having an input end and an output end and coupled at the input end to said power take-off shaft and extending forwardly through said casing, a wheel axle extending horizontally and laterally through a forward portion of said casing adjacent the output end of said wheel drive transmission shaft, running wheels mounted on opposite ends of said axle for rotation therewith and intermeshing gear means mounted on the output end of said wheel drive transmission shaft and said axle for driving said axle and said wheels when said transmission shaft is driven by said engine and drives said cultivator tine shaft and tines, said power take-off shaft and said wheel drive transmission shaft, wherein when said wheel unit is detached from the transmission housing, said apparatus is used as a rototiller.

4,640,367

ROLL-OVER DISC PLOW

Ventura J. Lawrence; Charles G. Metcalf, both of Stockton, and Lawrence H. Silva, Manteca, all of Calif., assignors to Tractor Plow Co., Inc., Stockton, Calif.

Filed Nov. 1, 1985, Ser. No. 793,829
Int. Cl.[4] A01B *3/42*
U.S. Cl. 172—225 **6 Claims**



1. A roll-over disc plow comprising a base frame symmetrical in plan about a longitudinal axis and including a transverse leading beam and side beams merging with the ends of said leading beam and having a convergence rearwardly, a coaxial forward journal in said leading beam, a coaxial rearward journal in said convergence, a plow frame including a plow beam extending diagonally in plan across said axis and including a cross beam adapted to flex rearwardly under load, means for mounting said plow frame in said forward journal and in said rearward journal, a plurality of disc plows arranged along and mounted on said plow beam, means interconnecting said plow frame and said main frame for rotating said plow frame about said axis and with respect to said main frame to lie in either of two extreme positions, said side beams each including a forward upper surface and a rearward upper surface vertically offset upwardly from said forward upper surface, said side beams each further including an upstanding step, each of said upstanding steps comprising a substantially vertical surface interconnecting said forward upper surface with said rearward upper surface, said upstanding step being positioned relative to said cross beam so as to be adjacent with said cross beam when said cross beam is unloaded and to be abutted by said cross beam when said cross beam flexes under plowing load.

4,640,368

DRAFT SENSOR INCLUDING STRAIN SENSOR COUPLED TO LOAD STRAP

Carl E. Kittle, Cedar Falls; Arthur J. LaFave, and David L. Olson, both of Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 27, 1986, Ser. No. 834,002
Int. Cl.[4] A01B *63/112*
U.S. Cl. 172—430 **5 Claims**

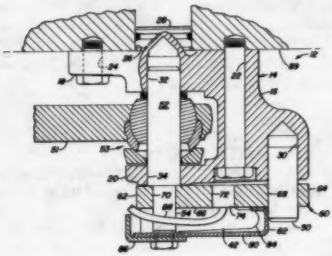
1. A draft force sensor for sensing generally fore-and-art loads comprising:

a bracket comprising a base fixed to a frame of a vehicle and a pair of legs extending from the base, the legs being

spaced apart in a direction which is transverse to the fore-and-aft direction;

a shaft supported by and extending between the legs for movement relative thereto;

means for coupling a generally fore-and-aft extending draft link to the shaft;



a generally fore-and-aft extending load strap having one end supported by the bracket and having another end rigidly fixed to the shaft so that fore-and-aft loads on the shaft create fore-and-aft strain in the load strap, the bracket preventing strain in the strap due to bending of the shaft and vertical loads on the shaft; and

a strain sensor coupled to the load strap for generating a signal representing strain in the load strap.

4,640,369

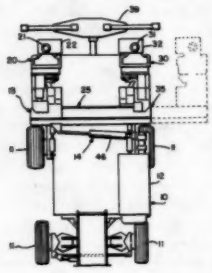
SLIDE BAR MINING BOLTING MACHINE

Wynand M. Goyarts, Bristol, Tenn., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 7, 1984, Ser. No. 669,235

Int. Cl.[4] E21C *11/02*; E21D *20/00*

U.S. Cl. 173—42 **5 Claims**



1. A mining bolter machine comprising:

a main body;

a main drill support structure connected to the main body and transversely movable relative to the main body by a selected amount to either side of the main body;

a first drilling mechanism attached to the main support structure and transversely movable relative to the main support structure by a selected amount to one side of and beyond the main structure;

a second drilling mechanism attached to the main support structure and transversely movable relative to the main support structure by a selected amount to the other side of and beyond the main structure;

a means for transversely moving the first drilling mechanism relative to the main support structure to selected positions; and

a means for transversely moving the second drilling mechanism relative to the main support structure to selected positions.

4,640,370

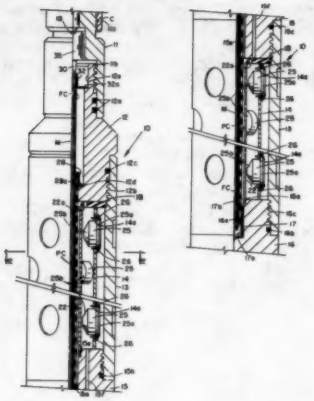
PERFORATING GUN FOR INITIATION OF SHOOTING FROM BOTTOM TO TOP

Rodney J. Wetzel, Woodlands, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 11, 1985, Ser. No. 743,429

Int. Cl.[4] E21B *43/1185*

U.S. Cl. 175—4.6 **8 Claims**



1. A perforating gun for an elongated production formation of a subterranean well, comprising, a plurality of shaped charge containers, each container having a primer containing end; carrier means for mounting said containers in vertically and angularly spaced relation with all said primer containing ends disposed substantially the same radial distance from the well axis; a fusible guide tube coaxially located in the well and defining a continuous axial passage adjacent said primer ends of said shaped charge containers; a continuous length of high detonating energy primer cord extending through said continuous axial passage; length of low detonating energy fusible cord also extending through said continuous axial passage, a firing mechanism at the top of said fusible guide tube for detonating said fusible cord, and a booster charge operatively connected to the bottom ends of said primer cord and said fusible cord, whereby said primer cord is detonated from the bottom up, thereby melting said fusible guide tube and firing said shaped charges in succession from the lowermost one upwardly.

4,640,371

PROCESS AND TOOL FOR BORING CAVITY HOLES, MORE ESPECIALLY IN CONCRETE PLASTER OR SIMILAR WALLS

Paul Moraly, Rosny Sous Bois, France, assignor to Sarkis S.A., Chexbres, Switzerland

Filed Jun. 14, 1985, Ser. No. 744,607

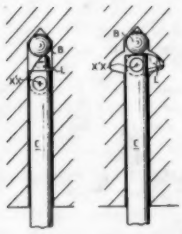
Claims priority, application France, Aug. 16, 1984, 84 12859; Dec. 31, 1984, 84 20102

Int. Cl.[4] E21B *10/32*

U.S. Cl. 175—61 **13 Claims**

1. An expansion bit, comprising at least one blade movable angularly about a transverse axis disposed at one end of an elongate rotatable shank and a further member which has a first smooth shaped camming surface portion having a symmetry of revolution about the shank axis, said blade having a second shaped smooth camming surface portion adapted for

engagement with said first shaped surface portion, said blade further having a cutting surface portion opositely disposed with respect to the second smooth surface portion, the first and second mutually engaging surface portions being so shaped and arranged that the cutting surface portion of the blade, passes, for a short axial travel distance of the shank within a



hole in the direction of the bottom of said hole and beyond the point where the further member abuts against the said bottom from a substantially axial orientation to a substantially transverse orientation in which the cutting surface portion is nearer to the opposite end of the shank than the second smooth surface portion.

4,640,372

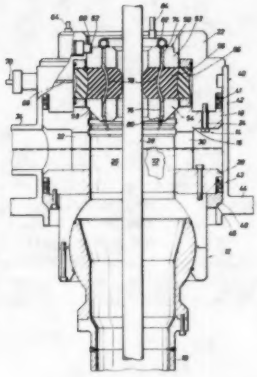
DIVERTER INCLUDING APPARATUS FOR BREAKING UP LARGE PIECES OF FORMATION CARRIED TO THE SURFACE BY THE DRILLING MUD

Haggai D. Davis, 1910 McDermott Dr., Morgan City, La. 70380

Filed Nov. 25, 1985, Ser. No. 801,294

Int. Cl.⁴ E21B *21/06*

U.S. Cl. 175—208 **3 Claims**



1. In a diverter for drilling mud having a packer-housing mounted on the upper end of a riser through which drilling mud flows to the surface between the riser and the pipe string extending through the riser and a packer located in the packer-housing, said packer having a body of resilient material, and means for moving the resilient material into sealing engagement with a pipe string to divert drilling fluid laterally into a mud return line, the improvement comprising a plurality of conduits extending vertically through the packer, each conduit including a flexible section extending through the body of resilient material to move with the resilient material as it is moved into and out of sealing engagement with the drill string, means supplying the upper ends of the conduits with drilling fluid, and nozzles located in the lower ends of the conduits to direct the drilling fluid into the drilling fluid below the packer.

4,640,373

BORE HEAD FOR DEEP-HOLE BORING

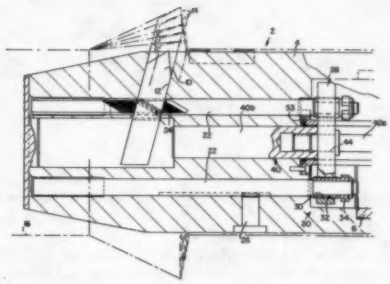
Wilfried Horsch, Obrigheim, Fed. Rep. of Germany, assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 19, 1985, Ser. No. 703,069

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410967

Int. Cl.⁴ E21B *7/28*

U.S. Cl. 175—272 **1 Claim**



1. An improvement in a bore head for deep boring of the type comprising a plurality of circumferentially spaced cutting members adjustable transverse to the bore head axis, and an actuating device actuatable by a drive motor for adjusting the cutting members, the improvement wherein said actuating device comprises a plurality of actuating rods positioned parallel to each other, each actuating rod being operably associated with a respective cutting member, a plurality of force transmitting means, each force transmitting means being adapted for actuating and displacing a respective actuating rod in a direction parallel to said bore head axis whereby respective cutting members are actuated, each of said force transmitting means includes a gear means having inclined teeth provided at the sides of said associated cutting member, each actuating rod being displaceable in a direction parallel to the bore head axis for acting on a respective associated cutting member by a respective force transmitting means, said actuating rods being secured against rotation and connected to a central actuating bar having a common connecting member, said connecting member comprises a disc disposed in a radial plane, said disc beign provided with a central opening for receiving a part of the actuating bar and having a plurality of circumferentially spaced openings for receiving the actuating rods said central actuating bar beign axially displaceable by a drive motor for actuating said cutting members.

4,640,374

ROTARY DRILL BIT

Mahlon D. Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 575,398, Jan. 30, 1984, Pat. No. 4,538,691. This application Sep. 3, 1985, Ser. No. 771,877

Int. Cl.⁴ E21B *10/04, 10/60*

U.S. Cl. 175—393 **5 Claims**

1. A rotary drill bit for cutting in earth formations, comprising:

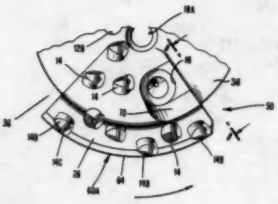
a bit body including a cutting face having an outer peripheral edge and a central recess extending longitudinally inwardly from said peripheral edge,

a plurality of bores formed in said cutting face and containing nozzles for emitting drilling fluid under pressure,

a plurality of cutter elements, some of which being mounted in said peripheral edge, and others of which being

mounted in said recess to fracture an earthen core formed as the drill cuts through the formation, said cutter elements including cutting faces facing in a direction defining a direction of rotation of said drill bit,

a plurality of lateral discharge passages formed in said body, said passages extending radially through said body from said recess and extending longitudinally to said peripheral edge to form circumferential interruptions in said peripheral edge,



a convex protrusion disposed centrally at a longitudinally inner end of said recess for deflecting cuttings to said lateral discharge passages,

said cutting face including a groove extending in said direction of rotation from one side of an outer end of each said bores and terminating at the nearest said discharge passage for conducting cuttings from said bore to that passage.

4,640,375

DRILL BIT AND CUTTER THEREFOR

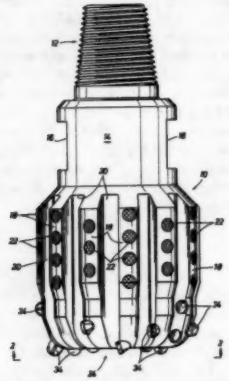
John D. Barr, Gloucestershire, and John M. Fuller, Stroud, both of United Kingdom, assignors to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 443,657, Nov. 22, 1982, Pat. No. 4,505,342. This application Feb. 8, 1984, Ser. No. 578,182

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.⁴ E21B *10/46*

U.S. Cl. 175—410 **18 Claims**



1. A drag-type drill bit comprising:

a bit body adapted for rotative movement in a pre-determined direction in use and having an operating end face;

and a plurality of cutting members mounted in said bit body, each of said cutting members having

a stud portion disposed in a respective recess in said bit body and defining the inner end of said cutting member,

and a cutting face generally adjacent the outer end of the cutting member facing outwardly through said end face of said bit body and terminating in an outermost cutting edge,

the centerline of said stud portion being rearwardly inclined from said outer end to said inner end with respect to said direction of movement in use—taken at the midpoint of said cutting edge—at a first angle from 80° to 30° inclusive;

and said cutting face being oriented such that the tangent to said cutting face at the midpoint of said cutting edge and in the central plane of the cutting member, is disposed at a second angle, from 18° to 75° inclusive, with respect to the centerline of said stud portion.

4,640,376

DEVICE FOR TESTING, IN PARTICULAR OF TABLETS BY WEIGHING

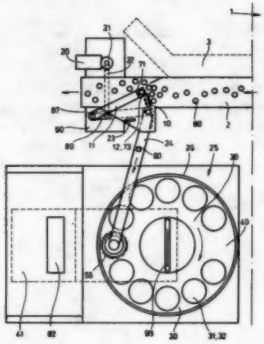
Jürgen Hinzpeter, Schwarzenbek, Fed. Rep. of Germany, assignor to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 797,419

Claims priority, application European Pat. Off., Nov. 10, 1984, 84113592.4

Int. Cl.⁴ G01G *19/52;* G01N *1/04*

U.S. Cl. 177—50 **11 Claims**



1. Device for testing, in particular tablets with a scale on which the tablets, which are being filled into containers, are individually weighed, characterized in that the device is provided with an arm (11) which can be pivoted into the tablet flow, which at its head is provided with a cage (12) for receiving an individual tablet (80) and transferred to a container (31) which is disposed in a hole (32) of a rotatably mounted apertured disk (30) under which a scale (41) for the container (31) is mounted.

4,640,377

MOTOR VEHICLE

Heinz Wössner, P.O. Box 1140, D-7605 Bad Peterstal-Griesbach, Fed. Rep. of Germany

PCT No. PCT/EP83/00302, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/01923, PCT Pub. Date May 24, 1984

PCT Filed Nov. 15, 1983, Ser. No. 628,586

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242408

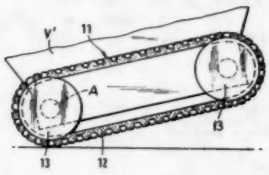
Int. Cl.⁴ B62D *53/00, 53/02;* B60D *15/00*

U.S. Cl. 180—9.1 **11 Claims**

1. A crawler vehicle having two sides, two crawler belts on each side of the vehicle, each crawler belt having a profiled tread with transverse profiling having segments in the form of cleats, transverse ribs or the like, said segments being arranged

in spaced relationship in the running direction of the respective belt, each profiled tread comprising two partial profiles which are adjustable relative to one another in the running direction.

9. A vehicle having two wheels, each wheel having a profiled tread with transverse profiling, having segments in the



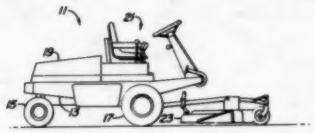
form of cleats, transverse ribs, or the like, said segments being arranged in spaced relationship in the running direction of the respective wheel, each profiled tread comprising two partial profiles which are adjustable relative to one another in the running direction, the partial profiles being formed on coaxial running wheels.

4,640,378

POWER TAKE-OFF SYSTEM AND ISOLATION MOUNTING THEREFOR

Dale R. Dobberpuhl, Horicon, and David K. Stricker, Juneau, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Aug. 22, 1985, Ser. No. 768,980
Int. Cl.[4] B60K *5/10*
U.S. Cl. 180—53.1 **13 Claims**



1. A power take-off assembly and isolation mounting arrangement for mounting to the frame of a vehicle having an engine mounted to said frame, said engine having an output shaft in driving communication with the input shaft of a transmission comprising:

a formed bracket with a hole therein operatively connected to said frame;

a brace having a generally elongated hole formed therein and a key formed thereon;

an isolation member mounted to said bracket and said brace such that said bracket radially aligns said hole's elongation of said brace to the axial extension or projection of said output shaft, thereby permitting limited deflection of said brace from a nominal position;

a casting having a keyway formed therein and a bearing seat having a bearing mounted therein, said keyway being sized to slidably receive said key therein and being oriented to maintain radial alignment of said hole's elongation to said output shaft;

means for slidably mounting said casting to said brace such that said key is received in said keyway of said casting and such that said casting can slidably displace coextensive relative to said elongation of said hole in said brace from a nominal biased position, whereby said nominal biased position positions said key in first extreme position in said keyway;

a PTO shaft rotatably supported in said bearing seat at one end and extending through said elongated hole of said brace;

means, supported by said brace, for providing driving communication between said output shaft of said engine and said PTO shaft; and

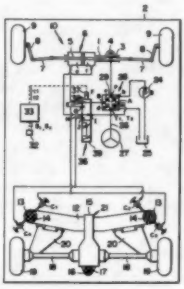
means for rotatably supporting the other end of said PTO shaft such that said PTO can experience limited pivotal motion thereabout.

4,640,379

VEHICLE STEERING CONTROL SYSTEM

Yasuji Shibahata, Yokohama; Yasumasa Tsubota, Yokosuka, and Takaaki Uno, Zama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 15, 1984, Ser. No. 661,070
Claims priority, application Japan, Oct. 27, 1983, 58-166592[U]
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—140 **13 Claims**



1. A vehicle steering control system comprising:

means for providing hydraulic fluid under pressure;

a fluid control valve for controlling the hydraulic fluid form said hydraulic fluid providing means in response to rotation of a steering wheel;

front wheel operating means for controllably power assisting steering of front wheels under the influence of the hydraulic fluid controlled by said fluid control valve;

rear wheel control means for controllably compliance steering rear wheels under the influence of the hydraulic fluid controlled by said fluid control valve; and

directional control means actuated in response to vehicle speed for selectively directing the hydraulic fluid controlled by said fluid control valve to said front wheel operating means for providing power assisted steering at a low vehicle speed range and to said rear wheel control means for providing compliance steering at a higher vehicle speed range.

4,640,380

APPARATUS FOR CONTROLLING A STEERING FORCE OF A HANDLE IN AUTOMOBILES

Toshihiko Daido; Hideo Matsubara, and Shuzo Hirakushi, all of Nara, Japan, assignors to Koyo Seiko Kabushiki Kaisha and Koyo Jidoki Kabushiki Kaisha, both of Osaka, Japan

Filed Apr. 8, 1985, Ser. No. 720,814
Claims priority, application Japan, Apr. 9, 1984, 59-69119
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—141 **14 Claims**

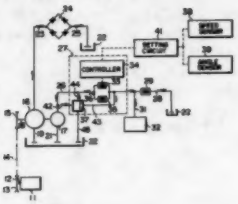
1. A handle steering force control apparatus for controlling a steering force of a handle in an automobile having a power steering system for assisting a steering force of the steering handle by a fluid from a fluid pump, and a hydraulic reaction chamber for applying a force opposite the steering force of the steering handle to the steering handle by the fluid, the steering force control apparatus comprising:

an auxiliary pump having a driving shaft common to a driv-

ing shaft of a fluid pump to suction a fluid for the power steering system,

a fluid passageway connected between an outlet of the auxiliary pump and a fluid tank for fluid,

a flow control device provided in said fluid passageway to control the fluid by the speed of the automobile and the steering angle,



A throttle means for said fluid provided in the fluid passageway on the outlet side of the flow control device, and

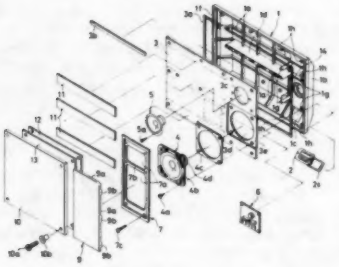
a fluid branch passageway for a hydraulic reaction chamber, one end of the fluid branch passageway being in communication with a portion of the aforesaid fluid passageway between the outlet side of the fluid control device and the throttle means and the other end thereof being in communication with the hydraulic reaction chamber.

4,640,381

WALL-MOUNTED RESIN SPEAKER CABINET

Yukio Tsuchiya, and Yutaka Matsukawa, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 628,084
Claims priority, application Japan, Jul. 4, 1983, 58-121255
Int. Cl.⁴ H05K *5/00*
U.S. Cl. 181—144 **17 Claims**



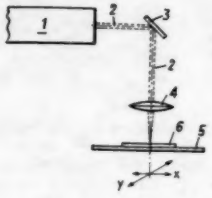
1. In a molded resin speaker cabinet, the improvement wherein said cabinet has a back wall and a plurality of side walls, at least one side wall of said cabinet being inclined inwardly towards said back wall of said cabinet; wherein at least one elongated rib is integrally formed with said back wall inside of said cabinet body and extends longitudinally inside the cabinet body parallel to two of said side walls, and further comprising a substantially planar baffle board secured in a front opening in said cabinet body, said baffle board having a rear surface in abutment with said elongated rib.

4,640,382

ACOUSTIC FRICTIONAL RESISTANCE CONSTRUCTION AND METHOD OF PRODUCING AN ACOUSTIC FRICTIONAL RESISTANCE USING A LASER

Hans Hartmann, Vienna, and Ewald Kerschbaum, Maria Enzersdorf-Südstadt, both of Austria, assignors to AKG Akustische u. Kino-Gerate GmbH, Austria

Filed Aug. 28, 1984, Ser. No. 644,982
Claims priority, application Austria, Aug. 29, 1983, 3077/83
Int. Cl.⁴ G10K *11/00;* **B23K** *9/00*
U.S. Cl. 181—175 **10 Claims**



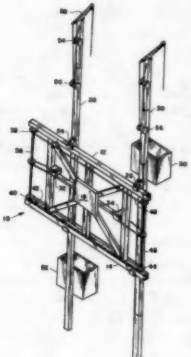
8. A method of forming an acoustic frictional resistance member having a selected known acoustical impedance comprising providing a flat plate having a thickness of from 0.1 to 1.5 mm, directing a laser beam at the plate to form a plurality of holes through the plate each having a diameter of 0.3 mm at most, supplying a constant air stream to the plate during the formation of the holes in the plate, measuring a pressure drop of the constant air stream at the plate, the pressure drop having the value corresponding to an instantaneous frictional resistance of the plate, comparing the instantaneous frictional resistance of the plate to a desired final frictional resistance of the plate, and stopping the formation of holes when the instantaneous frictional resistance meets the desired frictional resistance.

4,640,383

MOVABLE STAGING SCAFFOLD SYSTEM FOR BUILDING CONSTRUCTION

Claude A. Newberry, 4970 Avenida de Carmen, Santa Clara, Calif. 95054

Filed Feb. 3, 1986, Ser. No. 825,224
Int. Cl.⁴ E04G *1/22, 1/36*
U.S. Cl. 182—38 **8 Claims**



1. A movable staging scaffold system for positioning construction and maintenance workers adjacent the face of a structure said system comprising:

a frame assembly alignable in a substantially vertical plane and having spaced, parallel, substantially horizontal upper and lower rail members;

at least one vertical columnar member mounted for horizontal movement along said upper and lower rail members;

at least one worker car coupled to said vertical columnar member and vertically moveable along said member;

a structural support attached to said frame assembly; and

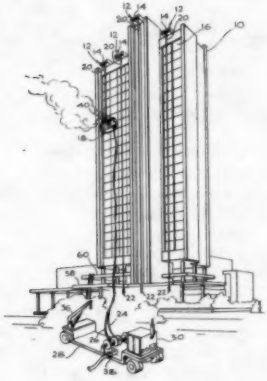
a knuckle assembly attached to said structural support and to a boom on a movable crane, said knuckle assembly providing powered horizontal and vertical pivotal movement between said crane boom and said scaffold system for the attitude control of said frame assembly.

4,640,384

EMERGENCY EVACUATION SYSTEM FOR HIGH-RISE BUILDINGS

Alexander Kucher, 1525 Nelson Ave., Manhattan Beach, Calif. 90266; Igor Krasnov, 2587 Captains Ave., Port Hueneme, Calif. 93041, and Yury Bromberg, 21802 Fairlane Circle, Huntington Beach, Calif. 92646

Filed Apr. 7, 1986, Ser. No. 849,120
Int. Cl.[4] B66B *9/00*; A62B *1/02*
U.S. Cl. 182—51 **10 Claims**



1. An emergency evacuation system for a high-rise building including:

a support structure secured to the top of said building, said support structure including at least one spool rotatably carried in said support structure;

cable means carried by said spool and selectively payable outwardly therefrom and re-windable thereon;

a weight-coupler carried by said cable at the end thereof remote from said spool;

brake means carried by said support structure in cooperative engagement with said spool for normally preventing rotation of said spool, said brake means being releasable;

escape cabin means having a powered spool thereon, said powered spool having a slot therein for receiving, in secure engagement, said weight-coupler;

electromechanical means coupled mechanically to said power spool for powering it in a controlled fashion to cause the rotation of said powered spool and the consequent raising and lowering of said escape cabin;

said escape cabin having an entry-exit side; and,

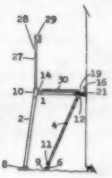
crawler means supported on said entry-exit side of said escape cabin for engaging said building during the raising and lowering of said escape cabin.

4,640,385

PORTABLE SCAFFOLDING

Philip O. Underhill, 5747 Newland Rd., Paradise, Calif. 95969

Filed Jun. 21, 1985, Ser. No. 747,557
Int. Cl.[4] E04G *1/32*
U.S. Cl. 182—113 **6 Claims**



1. A portable scaffolding structure, comprising

a. a horizontally positioned, T bar having a horizontally aligned walkway support member affixed thereto, the walkway support member attached removably to a downwardly slanted main support leg, the support leg fitted with an extension and a leveling foot pivotally attached at the ground rest position of said leg;

b. there being two angled side supports fastened by fittings affixed to V braces of the T bar, the two angled side supports adjustable for length and extending to a ground position approximately adjacent the main leg ground contact, each side support fitted with a pivotally attached leveling foot; the side supports adding angular bracing to the T bar and walkway support member;

c. there being a pliable ribbed covering on a wall facing surface of said T bar, and fitted to the top of the T bar, there being

d. a laterally adjustable angled nailer for nailing attachment to a wall surface and

e. the scaffold having a safety bracket with holding means for a security rail fittable into the top section of the said main support leg,

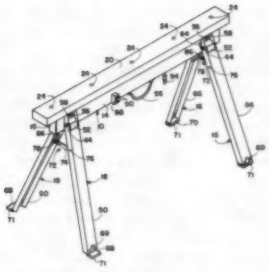
f. the scaffolding units used in pairs or more to provide an adjustable elevated walkway in a leveled position.

4,640,386

FOLDING UTILITY HORSE

James W. Hall, 3713 NE. 22nd Ave., Portland, Oreg. 97212

Filed Feb. 14, 1986, Ser. No. 829,213
Int. Cl.[4] B27B *21/00*; F16M *11/00*
U.S. Cl. 182—155 **16 Claims**



1. A folding utility horse comprising:

(a) a main beam extending horizontally when the utility horse is in its set-up position;

(b) a first pair of legs attached to and positioned at one end of the main beam;

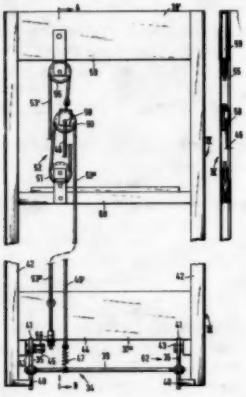
(c) a second pair of legs attached to and positioned at the other end of the main beam;
(d) pivot means mounting each leg, the pivot means including:
(1) a transverse mount extending outwardly from the main beam;
(2) a cross shaft mounted pivotally substantially at right angles to the transverse mount; and
(3) bearing means for mounting the leg pivotally on the cross shaft for pivotal movement along an axis substantially perpendicular to the axis of the pivot between the transverse mount and the cross shaft;
(e) stop means for abutment by the leg when the leg is in its extended position; and
(f) securing means for releasably fastening the leg in its extended position.

4,640,387

ELEVATOR COMPRISING TELESCOPIC SECTIONS, AND A LOCKING DEVICE THEREFOR

Albert Böcker, Werne, Fed. Rep. of Germany, assignor to Firma Albert Bocker GmbH & Co. Kg., Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 807,167
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1984, 3445244; Jan. 12, 1985, 3500841
Int. Cl.[4] E06C 7/06
U.S. Cl. 182—213 **16 Claims**



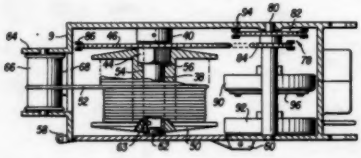
1. An elevator having a plurality of telescopic sections which are positively guided on one another, each telescopic section being of ladder-like formation having a pair of rails and a plurality of rungs extending between said rails, each pair of adjacent telescopic sections being lockable together by a respective locking device in a plurality of positions of extension, each locking device including a cable-actuated pivotable locking dog associated with one telescopic section of the associated pair of telescopic sections, each locking dog being provided with a support member for the other telescopic section of said pair of telescopic sections, each locking dog being actuated by a respective draw cable which actuates a respective locking-/release cable attached to a movably-mounted intermediate member, associated with said other telescopic section of said associated pair of telescopic sections, the improvements comprising constructing each of the locking devices by
(a) providing each of the intermediate members with a fixed pulley and a movable pulley,
(b) mounting each of the locking dogs for movement in a direction towards an unlocked position and in a direction towards a locked position, movement in one of said directions being a spring-loaded movement, and movement in the other of said directions being under the action of the associated draw cable,
(c) connecting each locking/release cable to the associated movable pulley, and
(d) passing the draw cable of each telescopic section around the associated fixed pulley and around the associated movable pulley.

4,640,388

ESCAPE DEVICE

John B. Walborn, Deer Path Run, Preston Rd., R.D. #1, Wernersville, Pa. 19565

Filed Feb. 6, 1985, Ser. No. 698,904
Int. Cl.[4] A62B 1/08
U.S. Cl. 182—231 **13 Claims**

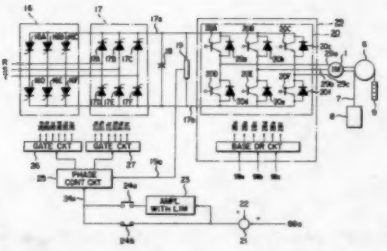


1. An escape device comprising:
a casing;
means for securing said casing to a support;
a cylindrical spool rotatably mounted in said casing;
a cable wound on said spool, said cable having one end secured to said spool and a second end having harness attachment means;
brake means operatively connected to said spool for limiting the rotational velocity of said spool; and
means for permitting rapid mounting and dismounting of said spool in said casing, whereby said spool can be rapidly replaced by a second spool following an unwinding of said cable from said spool,
wherein said casing includes at least first and second opposing walls, and wherein said means for permitting rapid mounting and dismounting comprises:
(a) a first shaft having one end fixed in said first wall and a second end extending toward said second wall,
(b) a door in said second wall adjacent said first shaft, said door being sized and shaped to permit passage of said spool,
(c) a bore in said spool, said bore being coaxial with the axis of said cylindrical spool and having a diameter sufficient to permit mounting of said spool on said first shaft, and
(d) means associated with said first shaft and said spool for rotatably connecting said spool relative to said brake means when said spool is fully mounted on said first shaft, and wherein said means for rotatably connecting said spool relative to said brake means comprise:
(e) a hex shaped enlargement of said bore at one axial end of said cylindrical spool,
(f) a hex nut rotatably mounted on said first shaft and fittable in said hex shaped enlargement,
(g) a spool sprocket rotatably mounted on said first shaft and fixed to said hex nut, and
(h) means rotatably connecting said spool sprocket to said brake means.

4,640,389
SYSTEM FOR CONTROLLING A MOTOR

Hiroshi Kamaike, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, JPX

Filed Dec. 21, 1984, Ser. No. 685,119
Claims priority, application Japan, Dec. 26, 1983, 58-250289
Int. Cl.[4] B66B *1/30*
U.S. Cl. 187—119 19 Claims



1. A system for controlling the speed of an alternating current elevator in which a direct current power from a direct current power source is converted into an alternating current power having a variable voltage and frequency by means of an inverter and the alternating power is supplied to an induction motor so that a cage is operated by controlling the motor in response to a speed command value, said system comprising an energy saving operation command unit which commands the energy saving operation;

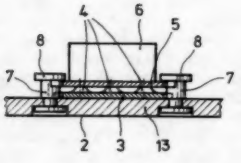
a low speed command generating circuit which generates a low speed command value lower than said speed command value; and

a frequency decreasing circuit which decreases the output frequency of the inverter in response to said low speed command value.

4,640,390
BRAKE LINING CARRIER FOR DISK BRAKES HAVING DIVIDED LINING ELEMENTS

Eckart Saumweber, Gauting, and Otto Schmitt, Munich, both of Fed. Rep. of Germany, assignors to Knorr-Bremse AG, Munich, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,655
Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317913
Int. Cl.[4] F16D *55/224, 65/04*
U.S. Cl. 188—73.37 9 Claims

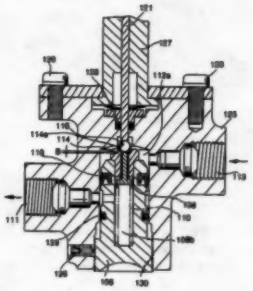


1. A braking lining carrier for disk brakes having divided lining elements, particularly for rail vehicles, comprising a base plate having a first side and a second side, an elastically deformable intermediate plate having first and second plane surfaces and said first surface thereof directly positioned on said second side of said base plate, a carrier plate having one side positioned on said intermediate plate and having another side to which is attached a divided brake lining element, said intermediate plate having a plurality of deformations protruding only from said second plane surface thereof and disposed in a substantially regular pattern at substantially the same distance from one another, said deformations being elastically deformable to a limited degree such that said carrier plate and attached brake lining element is elastically supported upon said base plate and capable of limited movement.

4,640,391
AUTOMATIC STOP VALVE DEVICE FOR VEHICLE BRAKE SYSTEMS

Toshifumi Maehara, Hanazono, and Masayuki Kurata, Kazo, both of Japan, assignors to Akebono Brake Industry Company, Ltd., Japan

Filed Jun. 28, 1983, Ser. No. 508,506
Claims priority, application Japan, Jul. 12, 1982, 57-120769
Int. Cl.[4] B60T *11/28*
U.S. Cl. 188—353 11 Claims



1. An automatic stop valve device adapted to be mounted in the brake system of a vehicle comprising:

a normally open valve mechanism capable of being shifted between an open and a closed state to open and close communication between an input fluid chamber connected to receive fluid pressure from a master cylinder of said system and an output fluid chamber connected to transmit said fluid pressure to a brake device of said system for applying the brakes, said valve mechanism including a valve element comprising a movable ball cooperating with and movable relative to a valve seat in the direction toward the seat;

first spring means for maintaning said valve mechanism in the normally open position before receiving fluid pressure from said master cylinder and during an initial stage of transfer of pressure fluid from said master cylinder through said valve mechanism;

second spring means urging said ball in the direction toward said valve seat to maintain the closed state in response to increase in fluid pressure in the input fluid chamber from the master cylinder;

an electromagnetic mechanism including a coil and a movable armature actuated by the coil and connected to overcome said first spring means and cause said valve mechanism ball to shift to said closed state upon said coil being energized as the vehicle comes to a stop to maintain said fluid pressure in said output chamber and transmitted to said brake device and thereby hold the brakes in applied condition, said electromagnetic mechanism further including an element extending from said armature and engaging said ball to overcome said second spring force for maintaining said valve mechanism in the normally open position and causing said ball to be positively shifted by said second spring means onto said seat upon actuation of said coil; and

unidirectional means independent of said valve mechanism for bypassing said valve mechanism and allowing pressure fluid to flow only from said input chamber to said output

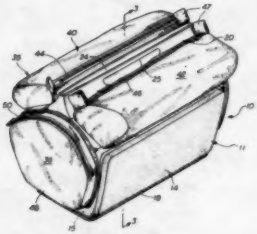
chamber upon increase in fluid pressure from the master cylinder and thereby increase the fluid pressure transmitted to said brake device and applying the brakes with said valve mechanism in its closed state.

4,640,392

ACCESSORY BAG FOR CONTAINERS

Joseph A. Decker, Jr., Katy; Joseph F. Fiore, Jr., and Stanley A. Katz, both of Houston, all of Tex., assignors to Igloo Corporation, Houston, Tex.

Filed May 8, 1985, Ser. No. 732,348
Int. Cl.[4] A45C *11/20, 13/28;* B65D *21/00*
U.S. Cl. 190—108 **6 Claims**



1. In a generally rectangular container having two opposed pairs of sides defining an open upper end, and a bottom extending between the sides to form a container body, a lid pivotally mounted on the container body having a pitched dome-like body forming a generally concave inner surface extending over said open end and a pair of opposed generally parallel ends secured to said dome-like body and extending alongside one opposed pair of sides on said container, and a handle projecting from the apex of said pitched body and having a elongate opening extending along the length of the container, said lid ends being mounted for pivotal movement on said opposed pair of sides for pivoting of said lid from a closed position in which the dome-like body covers said open upper end to an open position in which the dome-like body is removed from said open upper end to fully expose said open end, said dome-like body being of an inner shape and configuration to clear the upper portion of said container sides upon pivotal movement to open position;

the improvement of a flexible accessory bag mounted on the outer surface of the dome-like lid for pivotal movement therewith between said open and closed positions, said accessory bag comprising:

a pair of spaced elongate pockets arranged in parallel spaced relation to each other and receiving said handle therebetween, said pockets having openings to provide access thereto and means for selectively closing said openings;

a pair of opposed ends fitting over said lid ends and including means for releasably mounting the accessory bag on the lid for movement therewith; and

flexible connections between said pockets and said bag ends to permit folding movement of said bag ends relative to said pockets.

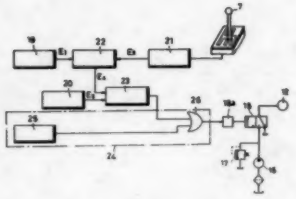
4,640,393

CONTROL DEVICE FOR VEHICULAR TRANSMISSION

Sadanori Nishimura, and Noboru Sekine, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,756
Claims priority, application Japan, Feb. 17, 1984, 59-26969
Int. Cl.[4] B60K *41/02*
U.S. Cl. 192—0.052 **3 Claims**

1. In a vehicular transmission of the type in which an auxiliary transmission having high and low speed transmission lines and clutch means is connected in series to a manual shift type main transmission connected to an engine through a transmission clutch and in which said auxiliary transmission is automatically shifted in accordance with the throttle opening of said engine and the vehicle velocity, the improvement comprising, a control device having low-speed transmission holding means for holding said auxiliary transmission in said low-speed transmission line for a predetermined period after said transmission



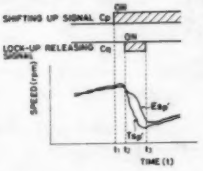
clutch has been applied, the control device including means for detecting actuation of the transmission clutch and initiating a signal in response thereto, and means for producing a signal to cause operation of the auxiliary transmission clutch means in response to the vehicle operating characteristics, and OR gate means for receiving both said signals from said detecting means and said auxiliary transmission clutch means.

4,640,394

LOCK-UP CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Haruki Higashi; Seiji Yashiki, both of Hiroshima; Kouichirou Waki, Mihara, and Toshiyuki Kikuchi, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 3, 1985, Ser. No. 730,036
Claims priority, application Japan, May 14, 1984, 59-96175
Int. Cl.[4] F16H *45/02;* B60K *41/28*
U.S. Cl. 192—3.29 **7 Claims**



1. A lock-up control system for an automatic transmission including a torque converter coupled with the output portion on an engine, a power transmitting gear arrangement coupled with the output portion of the torque converter and controlled to vary the transmitting gear ratio therein by gear ratio control means in accordance with a shifting up or down command supplied to the latter, and a lock-up clutch provided for locking up the output portion of the torque converter to the output portion of the engine, the lock-up control system comprising:

lock-up operation control means for controlling said lock-up clutch to be in its operative state and in its inoperative state selectively, and for causing said lock-up clutch to be in the inoperative state thereof when said gear ratio control means performs the control with the shifting up or down command, and

lock-up command means for preventing said lock-up operation control means from causing said lock-up clutch to be in the inoperative state thereof until a predetermined reductive variation in the speed of the output portion of said torque converter arises after the shifting up command

is supplied to said gear ratio control means under the condition in which said lock-up clutch is in operation to hold a lock-up state.

4,640,395

SLIP CONTROL MECHANISM FOR FRICTION CLUTCH IN TORQUE CONVERTER OF AUTOMATIC POWER TRANSMISSION

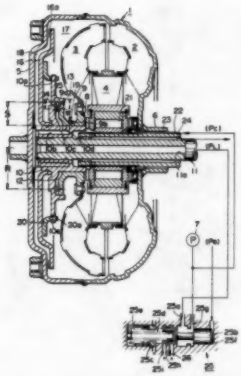
Takashi Murasugi; Masaaki Suga, both of Yokohama, and Yasuhiro Niikura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 5, 1984, Ser. No. 657,953

Claims priority, application Japan, Oct. 7, 1983, 58-186885

Int. Cl.[4] B60K *41/02*; F16D *47/06*

U.S. Cl. 192—3.31 **16 Claims**



1. A torque converter with a lock-up friction clutch comprising:

an input member driven to rotate by a prime mover;

an impeller rotating with said input member;

a turbine independently rotatable and cooperative with said impeller to form a toroidal circuit by which torque is exerted on said turbine by said impeller in a hydrodynamic drive mode;

an output member freely rotatable and coupled to said turbine to rotate therewith at a variable phase;

a friction clutch movable into and out of contact with said input member to establish frictional engagement to a variable degree with said input member in a mechanical drive mode;

hydraulic means associated with said friction clutch for moving the latter between a first state enforcing said mechanical drive mode and a second state enforcing said hydrodynamic drive mode, said hydraulic means including first and second fluid chambers on opposite sides of said friction clutch for moving said friction clutch in accordance with the fluid pressure difference therebetween;

means establishing fluid communication between said first and second fluid chambers; and

slip control means, associated with said passage means, for controlling fluid flow rate through said passage means for adjusting said fluid pressure difference, said slip control means including a throttle of variable cross-section disposed within said passage means for controlling the fluid flow rate, said throttle being so arranged that its cross-section increases to reduce the fluid pressure difference in a greater than linear relationship with the torque on said turbine.

4,640,396

DEVICE FOR CONTROLLING THE OPERATION OF CLUTCH FOR FLUID TORQUE CONVERTER

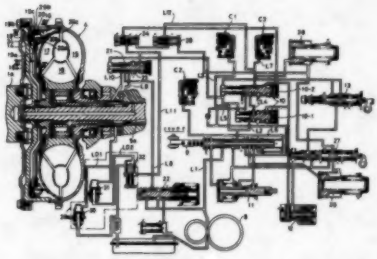
Sadanori Nishimura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1983, Ser. No. 495,267

Claims priority, application Japan, May 17, 1982, 57-81494; Nov. 11, 1982, 57-196840

Int. Cl.[4] F16H *45/02*; B60K *41/02*

U.S. Cl. 192—331 **19 Claims**



1. An apparatus for controlling the operation of a clutch for a torque converter of a transmission of a vehicle having a throttle-operated engine wherein the clutch is operated by differential fluid pressure thereacross between a direct coupling state and a slipping state, the apparatus including; means for fluid pressurizing the clutch to cause the direct coupling state at or above a relatively high speed of the vehicle and depressurizing the clutch to cause the slipping state at relatively low speeds of the vehicle speed including means for controlling and varying the pressure in the clutch in proportion to the vehicle speed when the vehicle is traveling at speeds above a predetermined speed and below the relatively high speed.

2. An apparatus for controlling the operation of a clutch for a torque converter of a transmission of a vehicle having a throttle-operated engine wherein the clutch is operated by differential fluid pressure thereacross between a direct coupling state and a slipping state, the apparatus including; means for fluid pressurizing the clutch to cause the direct coupling state at relatively high speeds of the vehicle and depressurizing the clutch to cause the slipping state at relatively low speeds of the vehicle including means responsive to the engine throttle for pressurizing the clutch in proportion to the throttle position.

4,640,397

ELECTROMECHANICAL FRICTION BRAKE FOR ACTUATING AND STOPPING A ROTATING ELEMENT IN PREDETERMINED POSITIONS

Antonio Santalini, Arconate, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Jul. 25, 1985, Ser. No. 758,915

Claims priority, application Italy, Mar. 5, 1985, 19757 A/85

Int. Cl.[4] F16D *13/40, 13/64, 69/02*

U.S. Cl. 192—18 B **6 Claims**

1. An electromechanical friction clutch and brake unit for driving and stopping a rotation element, for example the needle actuating shaft of a sewing machine, said friction brake and clutch unit comprising:

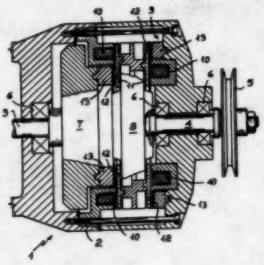
(a) a housing having a drive shaft and a driven shaft journalled in opposite side walls thereof;

(b) a flywheel mounted within said housing on said drive shaft for rotation therewith;

(c) a coupling disk mounted within said housing on said driven shaft;

(d) friction elements made of a mixture of blended natural and synthetic materials treated and impregnated with oil on each side of said coupling disk;

(e) counter elements mounted within the side wall of said housing in which said driven shaft is journalled and in said fly wheel adjacent said coupling disk, said counter elements being made of an oil impregnated sintered metal providing an oil reservoir capable of supplying oil by capillary action to said friction elements carried on said



coupling disk after said friction elements have used up the oil with which they are impregnated; and

(f) control and actuating means for selectively moving said coupling disk against said counter elements in said fly wheel and in such housing, as desired, to drive and stop said driven shaft, respectively.

4,640,398

FRICTION CLUTCH WITH TANGENTIAL LEAF SPRINGS

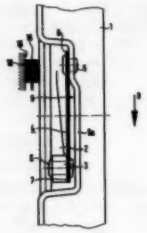
Dieter Kolb, Bad Kissingen, and Norbert Pieper, Werneck-Essleben, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,593

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3403024

Int. Cl.[4] F16D *13/71*

U.S. Cl. 192—70.18 **1 Claim**



1. A friction clutch unit for engine powered wheeled motor vehicles, comprising a clutch housing (1) having an axis and adapted for being fixed to a driving disc (10) rotating with a predetermined direction of rotation (D) in the pulling direction when the motor vehicle engine drives the motor vehicle as opposed to the pushing direction when torque is transmitted from the drive wheels to the motor vehicle engine, a pressure plate (2) connected to said clutch housing (1) for common rotation therewith about said axis and for limited axial movement with respect to said clutch housing (1), main spring means (14) supported by said clutch housing (1) and engaging said pressure plate (2) such as to urge said pressure plate (2) towards a clutch disc (16) and said clutch disc (16) towards a friction face (18) of said driving disc (10), means for connecting said pressure plate (2) to said clutch housing (1) consisting of a plurality of leaf spring elements (4) spaced circumferentially with respect to the clutch housing axis and which are substantially tangential with respect to said axis and have—with respect to said predetermined direction of rotation—a leading end portion (7) and a trailing end portion (8), respectively, the leading end portions (7) of all leaf spring elements (4) being fastened to said pressure plate (2) and the trailing end portions (8) of all said leaf spring elements (4) being fastened to said clutch housing (1), said leaf spring elements are secured to said pressure plate and clutch housing in a play-free manner.

4,640,399

AXIALLY ENGAGING TWIN PLATE FRICTION CLUTCH WITH ADJUSTMENT MEANS

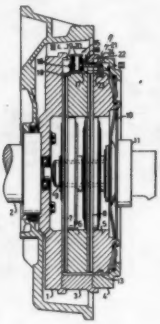
Tore L. Börjesson, Varberg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Nov. 6, 1984, Ser. No. 668,988

Claims priority, application Sweden, Nov. 8, 1983, 8306131

Int. Cl.[4] F16D *13/52*

U.S. Cl. 192—70.25 **5 Claims**



1. A vehicle clutch assembly comprising a clutch housing which can be connected to a flywheel, twin clutch plates which can be connected to an output shaft, an intermediate plate which is arranged to press the one clutch plate against a surface on the flywheel and which is coupled to the clutch housing via axially acting plate springs, a pressure plate which is arranged to press the other clutch plate against the intermediate plate and which is spring-biassed in a direction theretowards, disengaging means for moving the pressure plate away from said clutch plate, and means connected to the intermediate plate for centering said intermediate plate between the clutch plates when the clutch is disengaged, the plate springs active between the clutch housing and the intermediate plate being arranged to bias the intermediate plate in a direction towards said one clutch plate; and the centering means including means so arranged between the pressure plate and the intermediate plate that—departing from an engaged clutch—the pressure plate, when disengaging the clutch, is movable through a given limited distance in the clutch-disengaging direction prior to moving the intermediate plate.

4,640,400

AUTOMATIC WEAR COMPENSATION MECHANISM

Mototaka Nakane, and Shizuo Tanaka, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi and Toyota Jidosha Kabushiki Kaisha, Aichi, both of, Japan

Filed Mar. 7, 1985, Ser. No. 709,335

Claims priority, application Japan, Mar. 8, 1984, 59-042826

Int. Cl.[4] F16D *13/75*

U.S. Cl. 192—70.25 **10 Claims**

1. An automatic wear compensation mechanism for a clutch comprising:

a flywheel connectable to an input member,

a casing secured integral with the flywheel,

at least one pressure plate disposed between the casing and the flywheel,

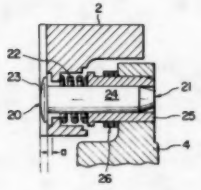
at least one clutch disc disposed between the flywheel and the pressure plate;

a spring mechanism for biasing the clutch disc and the pressure plate relative to the casing toward the flywheel, wherein the flywheel, the casing, the pressure plate and the clutch disc rotate integrally with each other;

wherein the compensation mechanism includes:

a ring member secured to said flywheel and disposed substantially outside of the pressure plate,

stopper means which is axially of the flywheel slidably fitted to the ring member and the pressure plate for allowing the pressure plate to move by a given length toward the casing relative to the ring member when a release mechanism acts on the spring mechanism for disengaging the clutch disc from the flywheel, the stopper means being engageable with the ring member at a predetermined axial sliding in a releasing direction of the pressure plate;



movement restriction means having a friction engagement member which is friction-engaged with the stopper means and in contact with the pressure plate at the side thereof directed to the flywheel for supporting and restricting the pressure plate due to the frictional force of the friction engagement member in an axial direction of the flywheel;

biasing means disposed coaxially with the movement restriction means for biasing the movement restriction means toward the casing; and

connecting means linking the ring member with the pressure plate toward the flywheel;

the frictional force of the friction engagement member being preset to a value lower than the biasing force of said spring mechanism and higher than the force of the biasing means applied upon the movement restriction means, and the biasing force of the connecting means being preset to a value lower than the force of the biasing means exerted to the movement restriction means.

4,640,401

VEHICLE CLUTCH LUBE CONTROL SYSTEM

Sarkis A. Koltookian, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 2, 1985, Ser. No. 730,006

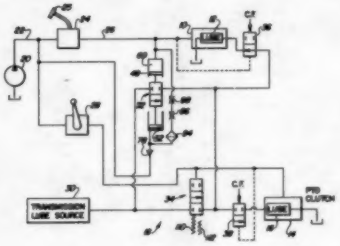
Int. Cl.[4] F16D *13/72, 13/74, 25/00*

U.S. Cl. 192—85 R **4 Claims**

1. In a vehicle having a fluid pressure operated torque-transmitting clutch having engaged and disengage states, a vehicle driven pump, a clutch lube circuit, a source of lube fluid, an operator-controlled control valve which receives system pressure from the pump and which provides a clutch operating pressure to the clutch, and a control system for controlling flow of lube fluid to the lube circuit, the improvement wherein the control system comprises:

a valve housing having a valve bore extending therein and having larger and smaller diameter bore portions, an end of the larger bore portion receiving clutch-operating pressure, an end of the smaller bore portion receiving system pressure from the pump, an inlet communicating the valve bore with the lube source and an outlet communicating the valve bore with the lube circuit; and

a pressure-responsive valve member movable in the valve bore, the valve member comprising a first land sealingly slidable in the first larger bore portion and exposed to clutch operating pressure, a second land sealingly slidable in the second smaller bore portion and exposed to system



pressure, one of the lands cooperating with a wall of the valve bore to control communication between the inlet and the outlet, and a stem interconnecting the first and second lands.

4,640,402

CLUTCH DISC

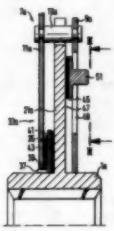
Franz Hartig, Dittelbrunn; Matthias Fischer, Euerbach, and Dagwin Tomm, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,352

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409869

Int. Cl.[4] F16D *3/14, 3/66, 13/75*

U.S. Cl. 192—106.2 **23 Claims**



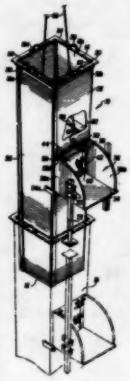
1. In a clutch disc for a motor vehicle friction clutch comprising a hub, a friction lining carrier mounted on the hub rotatably through a limited angle of rotation in relation to the hub about its axis of rotation, a torsional vibration spring means arranged in the torque transmission path between hub and friction lining carrier, at least one torsion vibration friction damper having at least two friction elements lying axially resiliently flat against one another, of which elements one is connected non-rotatably with the hub and the other with the friction lining carrier, the improvement comprising one of the friction elements being adjustably moveable along the friction face of the other friction element on one of the hub and the friction lining carrier, in such a way that the mutually overlapping friction faces of the friction elements are adjustable radially in relation to the rotation axis.

4,640,403

GRAVITY-CONVEYOR CHUTE SECTION

Daniel R. McDermott, 6105 Woodland La., Clinton, Md. 20615

Filed Feb. 13, 1985, Ser. No. 701,256
Int. Cl.[4] E04F 17/12
U.S. Cl. 193—34 6 Claims



1. A portable gravity conveyor chute section of a type which can be nested with other conveyor chute sections to form a gravity conveyor chute, the section comprising a sidewall having basically a tubular shape which guides items falling through a bore thereof, said section having an upstream end opening for receiving items dropped into said section from above, and a downstream end opening for discharging said items passing through the bore of said section, said downstream end being selectively engagable with the upstream end of an adjacent section to form said conveyor chute to be longer than a single section whereby items serially fall through the bores of said thusly engaged sections, said section further defining a side opening through the sidewall thereof at a position intermediate said upstream and downstream ends through which items can be dropped into the bore of said section, said section including a unitary door/ledge assembly mounted at said side opening, said door/ledge assembly comprising a door frame and a ledge member being fixedly attached together, and a hinge to hingedly attach said unitary door/ledge assembly at an edge of said side opening for allowing said door frame to be rotated inwardly into the bore of said chute section, thereby making the outside shape of said chute section more streamline, and to be rotated outwardly, thereby closing said door frame on the inside of the side opening with said ledge member extending away from said sidewall, and wherein is further included a door mounted on said door frame, whereby said door/ledge assembly forms a ledge and door for said side opening when it is rotated outwardly said door including latching means for selectively preventing said door from opening.

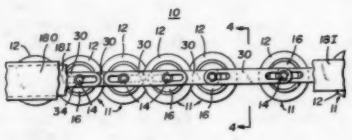
5. A portable gravity conveyor chute section of a type which can be nested with other conveyor chute sections to form a gravity conveyor chute mounted on the outsides of buildings, the section comprising a sidewall having basically a tubular shape which guides items falling through a bore thereof, said section having an upstream end opening for receiving items dropped into said section from above, and a downstream end opening for discharging said items passing through the bore of said section, said downstream end being selectively engagable with the upstream end of an adjacent section to form said conveyor chute to be longer than a single section whereby items serially fall through the bores of said thusly engaged sections, said section further defining a side opening through the sidewall thereof at a position intermediate said upstream and downstream ends through which items can be dropped into the bore of said section, said section including a door covering said side opening and being hingedly attached to said sidewall, said door including latching means for selectively preventing said door from opening; said conveyor chute section further including a baffle means positioned on and attached to the inside surface of said section adjacent said side opening said baffle means including an inwardly, downwardly sloping surface to deflect items falling through said section inwardly and including a tie means for receiving a hoisting line hook of a hoisting device for lifting said section, said tie means being accessible to someone outside said section reaching through said side opening, whereby, said portable section can be positioned on the outside of a building with said side opening facing said building, a hoisting device for lifting and manipulating said section can be made to extend a hoisting line having a hook on the end thereof through said upstream end opening of said conveyor chute section for positioning said hook near said side opening and someone from within said building can reach through said side opening and engage or disengage said hoisting line hook from said tie means without getting outside said building and said section.

4,640,404

TELESCOPIC ROLLER

Jeffry J. Bigott, 12832 Ponderosa Dr., Palos Heights, Ill. 60463

Filed Jul. 17, 1985, Ser. No. 756,037
Int. Cl.[4] B65G 13/12
U.S. Cl. 193—35 TE 8 Claims



1. A telescopic roller conveyor over which items may move and which may be telescopically extended and retracted, comprising, in combination:

two generally parallel but spaced-apart siderails, each formed of at least two generally channel-shaped members which are telescopically mounted together so that the siderails may extend from a contracted position to an extended position;

a plurality of roller units spanning between said siderails sequentially along the length thereof, each of said roller units including:

at least one roller,

axle means for mounting said at least one roller, and

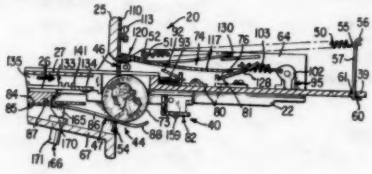
a pair of bushings, one of said pair of bushings at each end of said axle means, one of said bushings being received in one of said two siderails, and the other of said bushings being received in the other of said two siderails, said bushings being mounted therein so as to allow the roller unit to move longitudinally along the siderails; and

link means for interconnecting the sequence of roller units and allowing the spacing between adjacent roller units to vary over a limited distance, said link means being encased in said channel-shaped members during use, and during extension or contraction of the conveyor, so as to present no external, moving link-means parts that may interfere with the items carried by the conveyor or harm the user.

4,640,405
COIN CHUTE CONSTRUCTION AND METHOD OF MAKING SAME

Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed Jun. 22, 1984, Ser. No. 623,574
Int. Cl.[4] G07F 5/06
U.S. Cl. 194—235 29 Claims



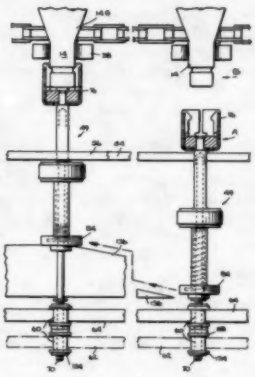
1. In a coin chute construction for a dispensing machine which requires at least one coin of predetermined size and valuation to initiate one operation of said machine for one item of goods or service, said construction comprising, a support body, a slider supported on said body for reciprocation in a rectilinear path between a fully retracted inoperative position and a fully advanced operative position thereof, at least one pocket in said slider for receiving said coin, said pocket being defined by surface means for supporting said coin so that upon moving said slider toward said operative position said coin is moved therewith to a test position and then toward said operative position, test means at said test position for testing said coin for acceptability as to valuation and genuineness and when acceptable allowing full movement of said slider to said operative position enabling said slider to initiate said one operation of said machine, means operative upon failure of said coin to satisfy the test provided by said test means at said test position to preclude said full movement to said operative position, and means for providing curvilinear movement of said coin away from and then back toward said rectilinear path during movement of said slider from said inoperative position to said test position, said providing means comprising baffle means and cooperating yieldable spring means, the improvement in which said spring means is a one-piece leaf spring member adapted to engage and provide the sole bottom support for said coin during said curvilinear movement and thereby assure precise introduction of said coin into said test means.

4,640,406
ROTATIONAL AND RETRACTABLE CONTAINER HOLDING DEVICE AND CONVEYOR THEREFOR

Beverly G. Willison, Akron, Ohio, assignor to Feco Engineered Systems, Inc., Cleveland, Ohio

Filed Oct. 3, 1984, Ser. No. 657,244
Int. Cl.[4] B65G 17/32
U.S. Cl. 198—377 4 Claims

1. A container holding device for receiving and gripping containers for conveying through one or more operating stations being adapted for mounting on chain conveyor unit having a plurality of links for supporting containers in a generally horizontal orientation comprising an elongated spindle attached at one of its ends to a conveyor link and extending laterally from one side of the conveyor unit, an inner housing including a tubular portion for internally receiving the spindle, and a cam follower forming part of the inner housing at its end adjacent the conveyor unit, the inner housing and cam follower as a unit being mounted for telescoping movement with respect to the spindle, means cooperating with the inner housing and the spindle for biasing the inner housing into a first telescoped position with respect to the spindle, an outer housing mounted at the other end of the inner housing for rotation about the spindle axis and the inner housing, the outer housing having means for engaging and gripping a container by its neck, whereby said inner and outer housing are adapted for axial sliding movement with respect to the spindle from the first telescoped position to a second telescoped position for receiving a container and for rotary movement of the outer

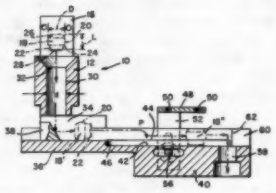


housing and container with respect to the inner housing and spindle for applying a coating to the container.

4,640,407
END PLUG ORIENTATION DEVICE

Wade H. Widener, Cayce, and Kenneth K. Klapper, West Columbia, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 563,898
Int. Cl.[4] B65G 47/22
U.S. Cl. 198—389 15 Claims



1. Apparatus for orienting articles, wherein the articles have a substantially right circular cylindrical configuration as defined about a longitudinal axis and characterized by a first diameter portion having a diametrical extent D, a second diameter portion having a smaller diametrical extent than said first diameter portion, and a length dimension L, comprising:

funnel means, having a longitudinal axis, for receiving said articles in a random manner wherein said longitudinal axis of each of said articles may be disposed in any one of an infinite number of orientations relative to said longitudinal axis of said funnel means;

passage means, having a longitudinal axis, connected to said funnel means for permitting passage of said articles through said passage means only when the longitudinal axis of each of said articles is disposed in a predetermined orientation relative to said funnel means and said passage means wherein said longitudinal axis of each of said articles will be diposed substantially co-axially with said longitudinal axis of said passage means while said first diameter portion of each of said articles will be disposed only in either a first mode in which said first diameter portions of some of said articles will be disposed vertically above their corresponding second diameter portions of said some of said articles or a second mode in which said

first diameter portions of the remaining ones of said articles will be disposed vertically below their corresponding second diameter portions of said remaining ones of said articles, and for preventing passage of said articles through said passage means when said longitudinal axis of each of said articles is disposed in an orientation different from said predetermined orientation;

means for re-orienting each of said articles passing through said passage means through an angle of 90° such that each of said articles has its longitudinal axis disposed horizontally; and

conveyor means for re-orienting each of said horizontally disposed articles through an angle of 90° such that said first large diameter portions of all of said articles are disposed vertically above said second smaller diameter portions of said articles for discharge in a final orientation mode.

4,640,408

FEEDER WITH AUTOMATIC ZONED PRODUCT TIMING CORRECTION

Fred W. Eaves, Clayton, Wis., assignor to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Continuation of Ser. No. 456,614, Jan. 10, 1983, abandoned. This application Jan. 23, 1985, Ser. No. 694,086

Int. Cl.⁴ B65G 47/26

U.S. Cl. 198—460 **7 Claims**

1. An electronic control system for a belt-type conveyer for causing products being carried thereby to be properly spaced for centering between adjacent pusher fingers defining a flight of a transfer mechanism, comprising in combination:

(a) first conveyer belt means adapted to receive products in ramdom sequence from a supply conveyer;

(b) first multi-speed motor means connected in driving relation only to said first conveyer belt means and said supply conveyer;

(c) backlog conveyer belt means for positioning said products in a serial head-to-tail touching relationshp and separation conveyer belt means respectively serially disposed downstream from said first conveyer belt means;

(d) second multi-speed motor means connected in driving relation only to said backlog conveyer means and said separation conveyer means with said separation conveyor means being continually driven at a speed slightly greater than the speed of said backlog conveyer means;

(e) electronic sensing means positionally associated with said backlog conveyer means for sensing the presence of a gap between adjacent products when said products are moving in the area between said backlog belt and said first conveyer belt means for increasing the speed of said first multi-speed motor means for closing said gap;

(f) servo control means for driving said second multi-speed motor means at a normal rate proportional to the speed of said transfer mechanism;

(g) zone defining means for establishing more than two discrete zones within said conveyer flight of said transfer mechanism, said zone defining means including means for generating a unique signal for each of said more than two discrete zones, and

(h) means coupled to said zone defining means and to said servo control means for increasing or decreasing the rate of said second multi-speed motor means for said normal rate by one of more than two speed change values which depends upon the relative positioning of said conveyer flight of said transfer mechanism at the instant that a product reaches a predetermined location with respect to said separation belt.

4,640,409

CONVEYOR FOR SHEET MATERIAL

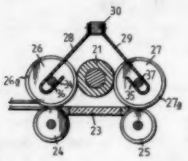
Lodewijk T. Holtman, Tegelen, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed May 16, 1984, Ser. No. 610,910

Claims priority, application Netherlands, May 31, 1983, 8301915

Int. Cl.⁴ B65G 29/00, 37/00

U.S. Cl. 198—624 **6 Claims**



1. A conveyor for conveying sheet material in sheet or web form, comprising two pairs of conveyor rollers disposed with their axes parallel to one another, each pair comprising a displaceable deformable conveyor roller and a cooperating substantially non-deformable conveyor roller; a substantially non-deformable drive roller operable to drive said pairs of rollers, said drive roller being mounted for rotation on a fixed axis intermediate said pairs of rollers; and means for pressing each of said deformable rollers in peripheral frictional driving relation against its cooperating non-deformable conveyor roller and in peripherial frictional driven relation against said drive roller so that at the corresponding nips of each said deformable roller deformations thereof cause substantially compensating changes of peripheral speed to keep said non-deformable conveyor rollers at an at least nearly identical peripheral speed.

4,640,410

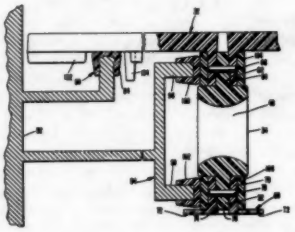
CONVEYING SYSTEM OF THE TYPE IN WHICH PLASTIC CARRIERS ARE MOUNTED ON PLASTIC LINKS OF A CONVEYOR CHAIN

Karl V. Palmaer, 694 Golfers Pass, Unit #2, Incline, Nev. 89450, and David B. Park, 28 Walnut St., Middleboro, Mass. 02346

Filed Oct. 11, 1983, Ser. No. 540,920

Int. Cl.⁴ B65G 47/84

U.S. Cl. 198—803.01 **7 Claims**



1. A conveyor comprising:

a chain including a plurality of plastic links connected together for relative pivotal movement, at least some of said links including an integral upwardly projecting first coupling element,

a plurality of plastic carriers mounted on at least some of said

links, said carriers each including an integral downwardly projecting second coupling element,

one of said first and second coupling elements comprising a socket of non-circular cross-section, and the other of said first and second coupling elements comprising a post of non-circular cross-section received in said socket with a tapered fit, and

a dowel pin frictionally disposed in aligned holes in each socket and post assembly,

at least some of said links including plastic hold-down members attached to lower portions thereof, said hold-down members each including at least one lateral flange adapted to engage the underside of a stationary guide, said hold-down members being replaceably mounted, and each including a socket which receives a downwardly projecting post on said link with a tapered fit, and a plastic pin disposed within aligned holes in said socket and post.

4,640,411

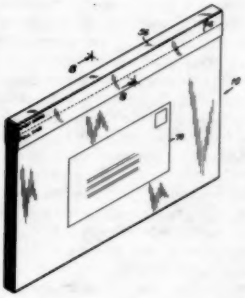
MAILER CONSTRUCTION

Guy A. Fery, New York, N.Y., assignor to Floating Sky, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,361, Dec. 13, 1982, Pat. No. 4,567,982, which is a continuation-in-part of Ser. No. 346,441, Feb. 8, 1982, Pat. No. 4,434,889. This application Nov. 7, 1984, Ser. No. 669,148

Int. Cl.⁴ B65D *75/20, 77/00*

U.S. Cl. 206—216 **9 Claims**



1. A mailing envelope for a multi-page book having front and back covers joined by a spine, comprising a receptacle having a base and four upstanding sides, said base and sides being formed from a sheet material and being foldable into an essentially planar configuration having a top edge and bottom edge, said folded receptacle being dimensioned to be wrapped about said book such that said top edge is proximate said spine-front cover joint and said bottom edge is proximate said spine-rear cover joint, and a closure strip affixed to said top and bottom edges of said receptacle and extending across said spine, said strip having means to permit separation of said edges such that the receptacle may be removed from the book and opened.

4,640,412

SELF-CONTAINING PACKAGE SYSTEM FOR STORAGE AND TRANSPORTATION OF PRE-FABRICATED PORTIONS OF A BUILDING STRUCTURE AND THE ASSEMBLY THEREOF

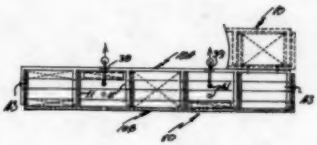
Joseph Skvaril, 4807 -143rd St., Edmonton, Alberta, Canada T6H 4C9

Filed Dec. 27, 1984, Ser. No. 686,829

Int. Cl.⁴ E04H *1/12*

U.S. Cl. 206—321 **32 Claims**

1. A floor/ceiling package for prefabricated structures, said package including two halves, each half including a plurality of spaced and parallel transverse joists, each including ends and a planar panel spanning one side of said joists and acting as a floor or ceiling surface, means to detachably secure said halves together along a common junction line to form a floor or ceiling unit, said unit including corners, said junction line extending parallel to said joists, each half having a joist at the common junction line for selectively securing said halves together, said halves being nestable one within the other to form said package when separated, one of said halves being



reversed vertically through 180° relative to the other half and placed whereby said joists of one half are nested within said corresponding joists of the other half so that said planar panels form upper and lower enclosure surfaces of said package, means to detachably secure said halves together to form said package and a perimetrical beam member engaging strut secured across the ends of all of said joists perpendicular to said joists and situated intermediate the upper and lower sides of said joists.

4,640,413

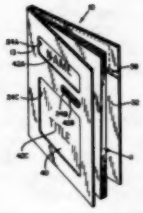
UNIVERSAL PACKAGE FOR PRERECORDED COMPUTER DISK AND ASSOCIATED INSTRUCTIONAL MATERIAL

Gary M. Kaplan; Robert T. Karau, both of Eugene; Norman E. Winney, Jr., Springfield, and David G. Brader, Eugene, all of Oreg., assignors to Communications Transfer Corp., Eugene, Oreg.

Filed May 31, 1985, Ser. No. 739,824

Int. Cl.⁴ B65D *27/30, 85/57*

U.S. Cl. 206—232 **7 Claims**



1. A package for displaying and selling a preprogrammed computer disk comprising:

(a) a sheet containing printed indicia relating to the particular computer program or series of programs being sold in the package; and

(b) a folder which is divided into at least two integral segments which are foldable relative to one another between a closed position wherein said sections overlie one another and an open position wherein said sections are disposed side-by-side, said folder including a front segment having an open pocket defined therein which removably receives said sheet and has openings defined therein which are arranged to permit viewing said identifying indicia through said package when said folder is in its closed position, and a rear segment having a closed pocket defined therein encapsulating the computer disk.

4,640,414

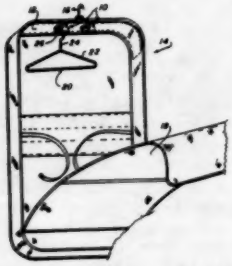
LOCKING TROLLEY FOR GARMENT BAG WITH IMPROVED HANGER RETENTION

Lawrence R. Mobley, and James S. Gregg, both of Aurora, Colo., assignors to Samsonite Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 673,353, Nov. 23, 1984. This application Jul. 12, 1985, Ser. No. 754,617

Int. Cl.[4] B65D *85/18;* B25B *5/08*

U.S. Cl. 206—287 **32 Claims**



1. A locking trolley for suspending and retaining hooked ends of clothes hangers within the interior of a garment bag, comprising:

a substantially rigid frame member of generally C-shaped configuration having an upper horizontal portion, a back vertical portion extending downward from the rear of the upper horizontal portion, and a lower horizontal portion extending forward from the lower end of the back vertical portion, the upper and lower horizontal portions being vertically separated by a space open at the front of the C-shaped frame member and closed at the rear of the frame member by the back vertical portion;

a jaw member pivotably connected at a rear end thereof to the vertical portion of the frame member and extending forward through the space at a location between the upper and lower horizontal portions and terminating at a forward end thereof;

a gripping structure connected to the jaw member and facing the lower horizontal portion of the frame member;

a gripping structure connected to the lower horizontal portion of the frame member and facing the jaw member;

the gripping structures contacting and retaining the hooked ends of the hangers when in operative hanger-end gripping adjacency with one another upon a predetermined degree of pivoting movement of the jaw member toward the lower portion of the frame member; and

the gripping structures separating to allow free movement of the hanger ends therebetween upon a predetermined degree of pivoting movement of the jaw member away from the lower portion of the frame member;

lip means extending above and at the forward end of the gripping structure connected to the lower horizontal portion of the frame member; and

a lever pivotably connected to the forward end of the jaw member, the lever having a lower end and an upper end extending in respectively opposite directions from the location at which the lever is pivotably connected to the jaw member, the lever pivoting between a first position in which its upper end extends into the space between the jaw member and the upper portion of the frame member and its lower end extends forward of the front end of the jaw member and a second position in which the lever generally extends across the space at the front of the C-shaped member; the upper end of the locking lever including means operatively contacting and moving along the upper portion of the frame member for pivoting the jaw member about its rear end into a generally aligned relation with the lower horizontal portion of the frame member in which the gripping structure on the jaw member is in hanger-end gripping adjacency with the gripping structure of the lower portion of the frame member as the lever is moved into the second position;

said lip means presenting an obstruction to the movement of the hanger ends from between the gripping structures at the forward ends of the gripping structures when the lever is moved into the second position.

23. A locking trolley adapted to be operatively connected to the interior surface of a top side gusset of a garment bag, and operative for suspending the hooked ends of clothes hangers within the interior of a garment bag on a non-inclined gripping structure when the trolley is in an unlocked condition, and operative for retaining the hooked ends of hangers on the gripping structure when the trolley is in a locked condition, comprising:

a substantially rigid frame member of generally C-shaped configuration having an upper horizontal portion, a back vertical portion extending downward from the rear of the upper horizontal portion, and a lower horizontal portion extending forward from the lower end of the back vertical portion, the upper and lower horizontal portions being vertically separated by a space open at the front end of the C-shaped frame member and closed at the rear end of the C-shaped frame member by the back vertical portion;

means for connecting the frame member to the garment bag with the upper portion of the frame member positioned facing the top side gusset and the lower portion positioned below the upper portion;

a jaw member extending generally forward through the space defined by the C-shaped frame member;

a gripping structure connected to the lower portion of the frame member and facing the jaw member, the gripping structure extending in a generally non-inclined and horizontal manner to contact and suspend the hooked ends of the hangers when the trolley is in the unlocked condition and to contact and retain the hooked ends of the hangers when the trolley is in the locked condition;

means connecting the jaw member to the frame member and operative for moving the jaw member toward the lower horizontal portion of the frame member to position the hanger ends in gripping adjacency and retention with the gripping structure when the trolley is in the locked condition, and operative for moving the jaw member away from the lower horizontal portion of the frame member to release the hanger ends for free suspension on the gripping structure and to provide an access opening in the space between the gripping structure and the jaw member when the trolley is in the unlocked condition;

selectively operable locking and unlocking means operatively connected between the jaw member and the frame member for maintaining the jaw member positioned toward the lower portion of the frame member to maintain the locked condition of the trolley and for releasing the jaw member for movement away from the gripping structure to achieve the unlocked condition of the trolley; and

means at the forward end of the gripping structure for obstructing movement of a hanger and from between the forward end of the gripping structure and the jaw member when the trolley is in the locked condition.

30. A locking trolley adapted to be operatively connected to the interior surface of a top side gusset of a garment bag, and operative for suspending the hooked ends of clothes hangers within the interior of a garment bag on a non-inclined resilient gripping structure when the trolley is in an unlocked condition, and operative for retaining the hooked ends of hangers on the resilient gripping structure when the trolley is in a locked condition, comprising:

a substantially rigid frame member of generally C-shaped configuration having an upper horizontal portion, a back vertical portion extending downward from the rear of the upper horizontal portion, and a lower horizontal portion extending forward from the lower end of the back vertical

portion, the upper and lower horizontal portions being vertically separated by a space open at the front end of the C-shaped frame member and closed at the rear end of the C-shaped frame member by the back vertical portion;

means for connecting the frame member to the garment bag with the upper portion of the frame member positioned facing the top side gusset and the lower portion positioned below the upper portion;

a jaw member extending generally forward through the space defined by the C-shaped frame member;

a resilient gripping structure connected to the lower portion of the frame member and facing the jaw member, the gripping structure extending in a generally non-inclined and horizontal manner to contact and suspend the hooked ends of the hangers when the trolley is in the unlocked condition and to contact and retain the hooked ends of the hangers when the trolley is in the locked condition;

means connecting the jaw member to the frame member and operative for moving the jaw member toward the lower horizontal portion of the frame member to position the hanger ends in gripping adjacency and retention with the gripping structure when the trolley is in the locked condition, and operative for moving the jaw member away from the lower horizontal portion of the frame member to release the hanger ends for free suspension on the gripping structure and to provide an access opening in the space between the gripping structure and the jaw member when the trolley is in the unlocked condition;

selectively operable locking and unlocking means operatively connected between the jaw member and the frame member for maintaining the jaw member positioned toward the lower portion of the frame member to maintain the locked condition of the trolley and for releasing the jaw member for movement away from the gripping structure to achieve the unlocked condition of the trolley; and

structural means the resilient gripping structure for increasing the compressibility of the resilient gripping structure over the compressibility provided by the resiliency of the material itself from which the gripping structure is formed.

4,640,415

CONTAINER HAVING AUTOMATIC DOORS AND FOR ACCOMMODATING DATA STORAGE MEDIA

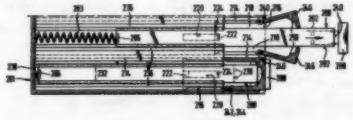
Peter Ackeret, Küsnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland

Filed Jan. 16, 1984, Ser. No. 570,912

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301203; European Pat. Off., Aug. 29, 1983, 83108481.9

Int. Cl.[4] B65D *85/676, 85/57*

U.S. Cl. 206—387 **12 Claims**



1. A container for accommodating at least one data storage medium, said container comprising:

(a) a housing having a base wall, a top wall, two side walls, a rear wall, and an open front face opposite the rear wall, and having at least one compartment therein;

(b) at least one slider member each for holding at least one data storage medium, the number of slider members at least corresponding to the number of compartments, said slider member being received in said compartment and being slidably movable into and out of the housing, the data storage medium being accessible for insertion or removal when the slider member is out of the housing;

(c) locking means for retaining the slider member in the housing;

(d) biasing means for ejecting the slider member from the housing when the locking means is released; and

(e) door means separate and distinct from the slider member, said door means being movable between an open position and a closed position for opening and closing the open front face of the housing wherein the door means is moved to the closed position by the insertion of the slider member into the housing and is moved to the open position by the ejection of the slider member from the housing.

4,640,416

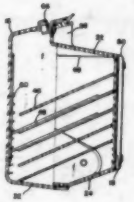
DISK STORAGE AND CARRYING CASE

Allan R. Northrup, and John G. Tomkinson, both of King County, Wash., assignors to Amaray International Corporation, Redmond, Wash.

Filed Apr. 12, 1985, Ser. No. 722,936

Int. Cl.[4] B65D *85/57*

U.S. Cl. 206—425 **20 Claims**



1. A storage case for floppy disks and similarly shaped articles, comprising:

(a) a base having an open interior and forming a receptacle for receiving and storing the articles;

(b) dividers positionable within the receptacle for separating and segregating the articles, including means for securing the dividers to the base, at least when the base is in a tipped, upright position and for securing the dividers to the base for tilting movement;

(c) a lid for selectively enclosing and exposing the interior receptacle and wherein the lid has a top interior surface positioned in a spaced relation to the top of the articles when they are placed in the receptacle;

(d) means for securing the lid to the base when the lid is enclosing the receptacle; and

(e) means, extending toward the interior from the top interior surface of the lid, for engaging the top of at least some of the articles to support a portion of the article's weight and to maintain their position relative to the dividers and other stored articles when the lid is closed and the base is in a tipped, upright position.

4,640,417

DISPLAY-PACKING UNIT FOR GLASSES AND SIMILAR ARTICLES

Philippe Durand, Arques, France, assignor to Verrerie Cristallerie d'Arques J. G. Durand & Cie, Arques, France

Filed Apr. 9, 1985, Ser. No. 721,225

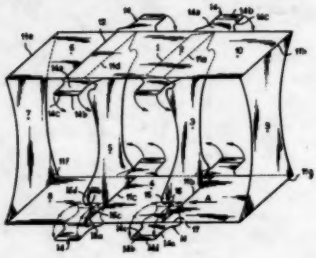
Claims priority, application France, Apr. 9, 1984, 84 05570

Int. Cl.[4] B65D *85/44*

U.S. Cl. 206—426 **10 Claims**

1. A collapsible and erectable display packing for glasses and similar objects, said display packing being formed from a generally rectangular cardboard blank having parallel transverse fold lines therein defining a plurality blank panels adapted to constitute wall sections of said display packing, said display packing having, when in an object-receiving state, a plurality of alternately upper and lower horizontal wall sections inter-

connected by vertical wall sections, a respective projecting tongue formed at each of the opposite side edges of each blank panel defining a horizontal wall section which in the object-receiving state of the display packing bridges a respective interior vertical wall section of the latter located intermediate the opposite ends of the display packing, each of said tongues having a first tongue panel connected along an inner fold line to the associated blank panel and further having a second tongue panel connected along a medial fold line to said first tongue panel and terminating in a free end edge, and a corresponding groove formed in each of the opposite side edges of each blank panel defining one of said respective interior vertical wall sections at the upper and lower regions thereof, each of said grooves having a first straight edge region extending inwardly of the respective blank panel from the associated side edge thereof at an acute angle to the associated transverse fold line and corresponding in length to the dimension of the respective first tongue panel between said inner and medial fold



lines, a second straight edge region extending from a juncture thereof with said first edge region outwardly of the respective blank panel at an angle to said first edge region and corresponding in length to the dimension of the respective second tongue panel between said medial fold line and said free end edge, and a projection extending from a juncture with and at an angle to said second edge region outwardly of the respective blank panel so as to overlie the portion of said first edge region adjacent said juncture thereof with said second edge region, said grooves thereby being configured for receiving the associated tongues so that when the display packing is in its object-receiving state, said first tongue panel of each tongue rests flush against said first edge region of the associated groove, said second tongue panel rests flush against said second edge region, and said free end edge of said second tongue panel is hooked behind said projection at said juncture thereof with said second edge region, thereby to hold and lock the vertical wall sections in position.

4,640,418

PROTECTIVE BULK PACK CONTAINER FOR ICE CREAM CONES

Bobby Lowry, Norcross, Ga., assignor to June A. Lowry, Decatur, Ga.

Filed Apr. 8, 1985, Ser. No. 720,997
Int. Cl.[4] B65D *81/16, 85/36*
U.S. Cl. 206—499 **2 Claims**

1. A protective bulk pack container for ice cream cones, comprising:

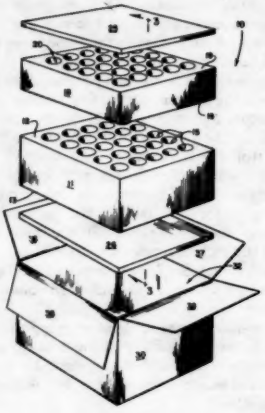
a plurality of stacks of nested ice cream cones, each of said cones being of substantially identical outside diameter;

a first protective body formed of a semi-rigid and resilient plastic foam material, said first protective body defining a plurality of cylindrical cone-receiving passageways extending the height thereof, so as to define openings in the top surface and the bottom surface thereof, each of said passageways in said first protective body being of such a diameter as to yieldingly receive one of said plurality of stacks of nested ice cream cones without causing damage to any of said cones but to suspend each of said cones within said stack within said passageway, thereby preventing any lateral movement thereof;

a second protective body formed of a semi-rigid and resilient plastic foam material, said second protective body defining a plurality of cylindrical cone-receiving passageways extending the height thereof, so as to define openings in the top surface and bottom surface thereof, each of said passageways in said second protective body being of a diameter substantially equal to that of said passageways in said first protective body,

said second protective body being configured for placement on top of said first protective body so as to align said passageways of said second protective body with said passageways of said first protective body;

a top cover member disposed on the top surface of said second protective body, said top cover member being formed of a rigid and resilient plastic foam, and dimen-



sioned to cover each of said plurality of openings defined in said top surface of said second protective body;

a bottom cover member disposed on the bottom surface of said first protective body, said bottom cover member being formed of a rigid and resilient plastic foam, and dimensioned to cover each of said plurality of openings defined in said bottom surface of said first protective body; and

an external container dimensioned to snugly receive said first protective body, said second protective body, said top cover member and said bottom cover member,

whereby insertion of a plurality of nested stacks of ice cream cones into said plurality of cone-receiving passageways in said first protective body and said second protective body provides a casing which envelopes said stacks of cones for shipping and storing and removal of said top cover member and said second protective body provides a container from which the cones may be dispensed.

4,640,419

PACKING STRUCTURE FOR A HANGING FAN

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

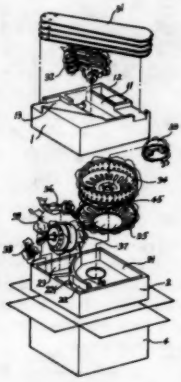
Filed Oct. 30, 1985, Ser. No. 793,111
Int. Cl. B65D *69/00*
U.S. Cl. 206—577 **7 Claims**

1. A packaging structure for a hanging fan of the type having a housing, a motor being disassemblable from the housing, and at least one fan blade, said structure comprising:

an upper storage tray having a substantially rectangular base, said base having a diagonal slot formed therein to receive the fan blade and further having four edges, said

tray further having four side walls, each side wall being secured to and extending downwardly from a respective edge of the base;

a lower storage tray adapted to receive the upper storage tray thereon, said lower tray having a substantially rectangular base having four edges, said lower tray further



having four side walls, each side wall being secured to and extending upwardly from a respective edge of the base, each of said side walls being of a height to receive the housing and the motor therein; and

a carton for receiving and enclosing the said upper tray and lower tray therein, and wherein the hanging fan is packaged.

4,640,420

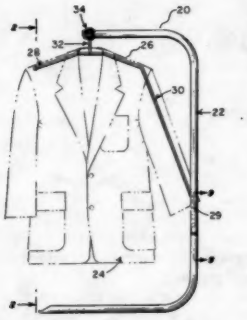
GARMENT LOCK

Scott A. McKay, 13811 Bessemer St., Van Nuys, Calif. 91401

Filed Oct. 20, 1983, Ser. No. 543,750

Int. Cl.[4] A47F 7/19

U.S. Cl. 211—4 20 Claims



1. A clothing rack comprising:

frame means comprising a first upright arm and a second upright arm;

at least one rod removably attached near one end to said frame means for retaining an article of clothing on said frame means;

locking means for locking said rod to said frame means, said locking means comprising:

a channel section having an edge and a web and connected between said first and second arms;

a hinged cover pivotally attached to said edge of said channel section;

at least one tapered opening in said web of said channel section for receiving said one end of said rod;

at least one stop means attached to said hinged cover for preventing the disengagement of said end of said rod with said channel section whenever said hinged cover is closed;

securing means for attaching the other end of said rod to said frame means and preventing separation of said rod from said frame means, said securing means being an elongate brace and extending between said arms.

4,640,421

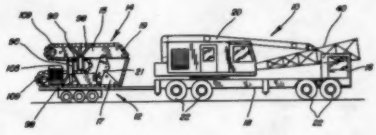
TRUCK CRANE CONVERSION TO CRAWLER CRANE

Daniel P. Mason, 4232 N. Kedvale, Chicago, Ill. 60641

Filed Feb. 26, 1985, Ser. No. 705,904

Int. Cl.[4] B66C 23/78

U.S. Cl. 212—175 10 Claims



1. A truck crane of the type having a crane mounted on a truck frame and using wheels for movement from one locale to another, being convertible to a self-powered crawler crane, comprisng in combination,

a crane of the type having its own control system, mounted on a truck frame having a truck cab with its own power source and drive train and vehicle wheels mounted thereon to accommodate the movement of said crane from one locale to another,

said crane further including an independent track control system mounted thereon,

said truck frame being split and being engageably disengageable into a forward frame section and a rear frame section,

said drive train being disengageable thereby to permit said forward frame section of said truck frame to be separable from said rear frame section thereof,

said truck frame further including a plurality of outrigger beams positioned on opposed sides of said rear frame section, each of said outrigger beams provided with upstanding standards fixedly secured to the outer end thereof and said outrigger beam further provided with at least one aperture adjacent to and rearward of said upstanding standard, each of said upstanding standards accommodating an outrigger jack mounted therein and adapted to reciprocate between a raising position and a retracted position,

said truck frame further including a plurality of first mount means positioned on opposed sides thereof,

a pair of portable crane tracks,

at least one of said pair of crane tracks having an independent power source carried thereon and further including flexible motive means for connecting said independent power source to said independent track control system,

each of said pair of portable crane tracks including mounting fixtures positioned thereon for engageable mounting with said first means of said truck frame where said truck frame is elevated by said outrigger jacks when reciprocated into the raising position thereof, and adapted to raise the level fo said truck frame relative to the ground such that said vehicle wheels are above ground level when said crane tracks are mounted on said truck frame and said outrigger jacks reciprocated into the retracted position thereof,

whereby said truck crane may be powered to a desired locale by the truck cab and thereafter, said truck cab forming said forward frame section being separated by

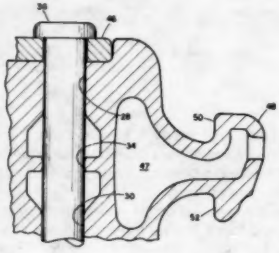
disengaging said truck frame and drive train into said respective forward and rear frame sections, raising said truck frame by means of reciprocating outrigger jacks into the raising position thereof, employing said crane to maneuver said portable crane tracks into position relative to said truck frame until said frame first mount means and said crane tracks mounting fixtures are in registry and secured together and connecting said flexible motive means to said independent track control system such that said truck crane is converted into a crawler crane having its own independent power source.

4,640,422

KNUCKLE STRUCTURE TO PREVENT KNUCKLE PIN FAILURE IN A RAILWAY COUPLER

William O. Elliott, Pittsburgh, Pa., assignor to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1985, Ser. No. 698,782
Int. Cl.[4] B61G *3/04*
U.S. Cl. 213—155 **6 Claims**



1. In a knuckle for a railway coupler of the type having a hub portion provided with a pivot pin hole and bounded on one side by a throat portion contiguous with a nose portion, the nose portion being adapted to be engaged by the nose portion of the knuckle of a cooperating coupler, and wherein said pivot hole is formed in a casting by upper and lower circular openings separated by an intermediate cavity; the improvement in said knuckle comprising an annular knuckle pin support surface in said intermediate cavity, said annular support surface having a diameter essentially corresponding to the diameter of said upper and lower circular openings for supporting a knuckle pin against bending between said upper and lower circular openings whereby bending stresses on the knuckle pin imposed by the nose portion of the knuckle of a cooperating coupler are materially reduced.

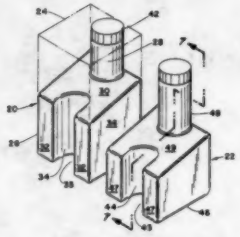
4,640,423

MULTIPLE VARIABLE CONTAINER PACKAGE

Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.

Filed Apr. 9, 1985, Ser. No. 721,195
Int. Cl.[4] B65D *21/02*
U.S. Cl. 215—10 **22 Claims**

1. A multiple container package comprising a plurality of mated containers each having an interior volume and an exterior volume, each container having a hollow body including two polygonal side walls, a polygonal rear wall, a polygonal front wall, a polygonal bottom wall and a top shoulder wall, with an elongated recessed surface adjacent one of said bottom and front walls forming a recess in each container, each recess in a bottom of a container extending through the rear and front walls of that container and each recess in a front wall of a container extending through the shoulder and bottom of that container, each container having a hollow neck connected integrally to said body and extending outwardly from said top shoulder wall into the recess of the recessed surface of another container, at least one wall of adjacent container bodies lying in contiguous relationship against each other, said plurality of containers forming a polyhedron having opposite side planes with one side wall of each container body lying in one side plane and the other side wall of each container body lying in the other side plane, one of the interior and exterior volumes of



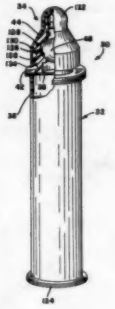
at least two of said plurality of containers being different from each other, said polyhedron being the minimum rectangular polyhedron which is needed to encompass at least one of said containers with its hollow body and neck, said at least one container having a neck which substantially fills the recess of another one of said containers.

4,640,424

SELF-OPENING NIPPLE CONSTRUCTION AND NURSING CONTAINER

Leonard A. White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 599,305, Apr. 12, 1984, abandoned.
This application Mar. 13, 1986, Ser. No. 840,523
Int. Cl.[4] A61J *9/00, 9/08, 11/00*; B65D *85/172*
U.S. Cl. 215—11 R **15 Claims**



1. An infant nurser comprising:

means defining a flexible plastic container having a penetrable wall portion;

a quantity of liquid within said container; and

a nipple assembly carried by said container adjacent said penetrable wall portion, said nipple assembly including:

a hollow flexible dispensing nipple including a base portion carried by the container and a flexible nipple portion;

accessing means associated with said nipple, said accessing means being axially movable upon lateral compression of the flexible nipple portion to penetrable said penetrable wall portion to permit dispensing of said liquid through said nipple; and

a cover enclosing said flexible nipple, said cover being axially substantially rigid and including means for lateral compression.

4,640,425

ONE-PIECE NURSING CONTAINER WITH MEANS FOR STORING NIPPLE

James L. Cabernoch, Cary, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,425
Int. Cl.[4] A61J 9/00, 11/00; B65D 85/72
U.S. Cl. 215—11 E 16 Claims

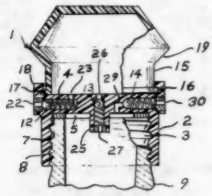
1. A nursing container comprising:
a web of flexible material having transverse and longitudinal dimensions;
a nipple assembly secured to said web and generally centrally disposed on one face of said web, the nipple assembly being a standard nipple assembly;
a first pair of side panels defined in said web on either side of said nipple assembly and joined together to enclose said nipple assembly;
means defining a peelable seal between said first pair of side panels to enclose said nipple assembly and adapted to access said nipple assembly for use;
a second pair of side panels extending from said first pair of side panels to the end of said web, the sides and ends of said second pair of side panels being joined together to form a liquid compartment;
a quantity of liquid in said liquid compartment;
said first pair of joined side panels form an inner compartment to enclose said nipple assembly and said second pair of joined side panels form an outer compartment for liquid and said nipple assembly;
an access port in said web communicating with said nipple assembly and said liquid compartment; and
means for defining a liquid tight peelable seal within said liquid compartment to close fluid communication with said access port until ruptured for use.

4,640,426

CAP FOR A CARBONATED BEVERAGE BOTTLE

Bernard Wasley, 212-11 85th Ave., Jamaica, N.Y. 11427

Filed Feb. 7, 1986, Ser. No. 826,921
Int. Cl.[4] B65D 51/24
U.S. Cl. 215—228 5 Claims



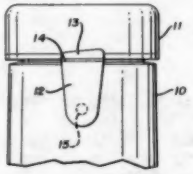
1. A cap for closing the mouth end of a bottle containing a beverage and for pressurizing the interior of the bottle with air, the cap comprising a body having a recess in a bottom end thereof adapted to receive the mouth end of the bottle, the body having a flat surfaced headpiece closing over a top end of the recess, a resilient bulb having an open bottom end seated on the headpiece, the bulb being compressible under manual pressure and adapted to re-expand to normal upon relaxing of said pressure, a normally closed spring loaded valve means in the headpiece having response to contraction of the bulb to allow air forced out of the bulb to pass through the headpiece to the mouth of the bottle, and a normally closed spring loaded ball valve means in the headpiece having response to re-expansion of the bulb to allow outside air to be drawn through the headpiece into the expanding bulb; wherein the recess in the body has a threaded wall adapted for engagement with a threaded neck of the bottle adjacent the mouth end; wherein a third normally closed spring loaded ball valve means is in the headpiece and is responsive to development of pressure above a predetermined value in the bottle to cause release of the excess pressure to atmosphere; and wherein the headpiece has a raised shoulder extending about the flat surface, and the bulb has a rib around its periphery interlocked in a complementary channel in the shoulder.

4,640,427

TAMPER-RESISTANT CLOSURE

Michael Marino, 540 Sampson St., New Castle, Pa. 16101, and Thomas C. Rudis, 2306 Eastman, Rolling Meadows, Ill. 60008

Filed Dec. 4, 1985, Ser. No. 804,498
Int. Cl.[4] B65D 41/34
U.S. Cl. 215—232 4 Claims



1. An improvement in a thermoplastic tamper-resistant closure for a thermoplastic cylindrical container of the type having a neck surrounding an opening to the container and having a closure retaining continuous thread pattern on said neck, said closure comprising means for covering said opening to said container and having an annular portion with inner and outer surfaces surrounding said neck, a continuous thread pattern in said inner surface of said annular portion of said closure for cooperation with said continuous thread pattern on said neck, the improvement wherein an integral depending tab is located on the outer surface of said annular portion of said closure and positioned alongside of said cylindrical container, a transverse tear line in said depending tab adjacent said annular portion of said closure defining a tear-away portion of said depending tab therebelow, an area of said tear-away portion and a matching area of said cylindrical container being bonded to one another whereby separation of said depending tab at said tear line leaves a small portion of said depending tab on said annular portion of said closure spaced with respect to said tear-away portion so that said closure can be rotated freely to remove the same from said neck of said container.

4,640,428

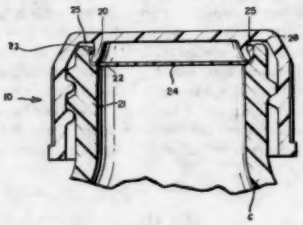
HIGH GAS BARRIER PLASTIC CLOSURE

Long Fei Chang, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 3, 1985, Ser. No. 772,277
Int. Cl.[4] B65D 53/04
U.S. Cl. 215—270 10 Claims

1. A plastic closure system for containers holding liquids under internal pressure, which provides good sealing and gas barrier properties, comprising a generally circular sealing member formed of at least two superimposed layers of different resins, said sealing member having a diameter larger than the inner diameter of the container inner neck wall, a plastic

overcap, said overcap having an integrally formed, annular member extending downward from the inner top wall thereof, said annular member having a diameter less than the topmost portion of the container inner neck wall, said container inner



neck wall formed with a radially inwardly extending annular ledge spaced below said topmost portion of said container neck, said ledge in said container neck and the lower edge of said annular member adapted to sealingly engage an annular portion of said sealing member positioned therebetween.

4,640,429

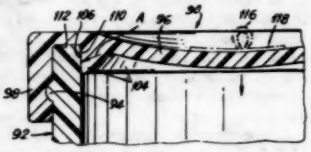
CLOSURE HAVING INTEGRAL FORMED SEALING MEANS

Jeffrey Sandhaus, Rte. 9W, Snedens Landing, N.Y. 10964

Division of Ser. No. 549,477, Nov. 7, 1983, Pat. No. 4,550,841, which is a continuation-in-part of Ser. No. 441,546, Nov. 15, 1982, Pat. No. 4,479,585, which is a continuation-in-part of Ser. No. 399,237, Jul. 19, 1982, Pat. No. 4,442,945, which is a continuation-in-part of Ser. No. 335,216, Dec. 28, 1981, Pat. No. 4,413,742. This application Jul. 30, 1985, Ser. No. 760,475

Int. Cl.⁴ B65D *45/32*

U.S. Cl. 215—320 **12 Claims**



1. A closure for closing an open end of a container, said open end having a sidewall including an outer surface, an inner surface, and a top surface, comprising:

a top;

a skirt depending from a peripheral edge region of said top, said skirt having a sidewall adapted to fit over said outer surface of said sidewall of said open end; and

means, coupled to said top, spaced radially inwardly from said sidewall of said skirt, for engaging said sidewall of said open end,

said top including means, disposed in a central region thereof, pivotable downwardly about said sidewall of said open end, for, with downward pivoting thereof, urging said engaging means outwardly against said sidewall of said open end of said container without affecting a disposition of said sidewall of said skirt relative to said sidewall of said open end of said container,

said engaging means extending downwardly from said urging means.

4,640,430

SCREW CAPS FOR CONTAINERS

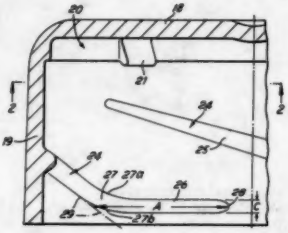
Peter R. Haines, Skelmersdale, England, assignor to M C G Plastics Limited, Lancashire, England

Filed Dec. 17, 1985, Ser. No. 809,866

Claims priority, application United Kingdom, Dec. 18, 1984, 8431914; Feb. 12, 1985, 8503523

Int. Cl.⁴ B65D *41/04*

U.S. Cl. 215—330 **7 Claims**



1. A cap for a container which cap comprises a top and a depending skirt having an internal surface which is formed with inward projections for screw-threaded engagement with the neck of the container, each of said projections having a surface facing generally towards the top which surface has, in the direction of rotation during application of the cap, a leading portion extending circumferentially with a zero helix angle and a trailing portion inclined towards the top.

4,640,431

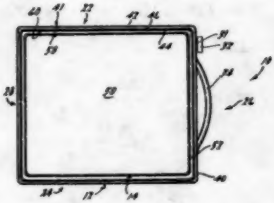
DUAL-CHAMBERED OIL CHANGING CONTAINER

Robert W. Harrison, 3475 Joan Drive, Mississauga, Ontario, Canada L5B 1T7

Filed Jul. 3, 1985, Ser. No. 751,687

Int. Cl.⁴ B65D *85/00*

U.S. Cl. 220—1 C **14 Claims**



1. A dual-chambered oil changing container comprising:

(a) a new oil chamber having a generally flat configuration defined by upper and lower broad, spaced surfaces, said upper surface having a shallow recess and a converging downward slope to a used oil inlet; and

(b) a used oil chamber situated beneath said new oil chamber, said used oil chamber having a generally flat configuration defined by a broad, spaced top and base, said top having a cylindrical extension that extends from said top through said lower surface of said new oil chamber and is integrally connected to said used oil inlet.

4,640,432
REFRIGERATION APPARATUS CABINET CONSTRUCTION UTILIZING PREPAINTED STEEL PANELS

Ralph Tate, Jr., Center Township, Vanderburgh County, and John T. Woods, Scott Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

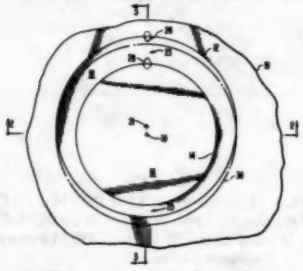
Filed Jul. 19, 1984, Ser. No. 633,214
Int. Cl.[4] B65D *6/34*
U.S. Cl. 220—75 21 Claims

1. A refrigeration apparatus cabinet wall structure comprising:
- a first cabinet wall;
- a second cabinet wall defining a transverse, first portion extending toward said first wall and having a second, edge portion adjacent said first wall, said second portion comprising a turned portion of said second wall connected to the transverse portion thereof by resiliently deflectible hinge means, said second portion being deflectible about said hinge means as an incident of the engagement of the distal end of said second portion with said first wall and defining therewith an acute angle thereby forming with said first wall a tapered sealant crevice; and
- a preselected quantity of sealant material in said sealant crevice.

4,640,433
ECCENTRIC KNOCKOUTS FOR METAL BOXES

Robert W. Jorgensen, Niles, Mich.; Thomas E. Lewis, and Gregory J. Kesler, both of South Bend, Ind., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Nov. 21, 1985, Ser. No. 800,318
Int. Cl.[4] B65D *41/32, 17/32*
U.S. Cl. 220—266 6 Claims

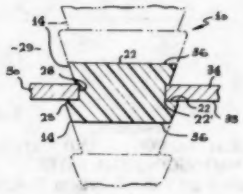


1. A knockout structure comprising
- a metal electrical box having a wall through which an electrical wiring passage is to be established, said wall being substantially planar and having opposite surfaces;
- means in said wall defining separations along first and second substantially circular punch lines, the circles of said punch lines having centers spaced from each other along a common diameter, said second punch line being totally within and spaced from said first punch line, said punch lines together defining
  - a first circular knockout having opposite surfaces substantially coplanar with said opposite surfaces of said wall, and
  - a second generally annular knockout surrounding said first knockout and having opposite surfaces offset from the planes containing said opposite surfaces of said wall, said second knockout having regions of maximum and minimum width on opposite sides of said first knockout along said diameter;
- a first bridge member crossing said first punch line and constituting the sole junction between said wall and said second knockout, said first bridge member being in said region of maximum width; and
- a second bridge member crossing said second punch line and constituting the sole junction between said first and second knockouts, said second bridge member joining said second knockout at said region of maximum width,
- whereby said knockouts can be selectively removed to open a hole through which conduit of either of two sizes can be attached to establish a wire passage with said conduit securely grounded to said wall.

4,640,434
PLUG FOR HOLE SEALING

Kenneth D. Johnsen, Worthington, and Alan J. Fletcher, Columbus, both of Ohio, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 24, 1986, Ser. No. 831,883
Int. Cl.[4] B65D *51/00*
U.S. Cl. 220—287 15 Claims



14. In combination, a fuel tank having a hole therein, said hole being plugged by a plug comprising a solid flexible rubber elongated and tapered body member formed of a series of successively reduced integral axially disposed tapered portions, each of said tapered portions having substantially the same angle of taper, the large end of each tapered portion being larger in radial extent than the tapered end of the adjacent tapered portion, and a bifurcated portion connecting the tapered ends of the successive larger tapered portions with the large ends of the adjacent tapered portions, said bifurcated portions being tapered in a direction opposite to the main direction of taper of said tapered portions, the hole being plugged by compressive contact of one or more of said tapered portions against the hole surfaces and edges, said plug being trimmed at the opposite ends to remove excess material.

4,640,435
PLASTIC CLOSURE FOR BEVERAGE CONTAINER

Herbert V. Dutt, Sarasota, Fla., assignor to Sun Coast Plastics, Inc., Sarasota, Fla.

Filed Jan. 23, 1986, Ser. No. 824,983
Int. Cl.[4] B65D *39/00*
U.S. Cl. 220—307 15 Claims

1. A plastic lid for a wide-mouthed plastic container wherein the container includes a side wall having at its upper peripheral edge a radially outwardly and downwardly flared locking flange terminating in a free flange edge, said lid comprising:
- a top wall having a peripheral rim extending generally up-

wardly, outwardly, and then downwardly from said top wall to define a V-shaped peripheral groove having inner, upper, and outer walls receiving the locking flange of a container;

an annular shoulder integrally formed within said peripheral groove on the outer wall thereof for engaging the free edge of the locking flange of a container; and

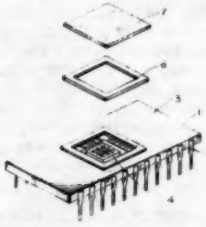
an annular bead extending outwardly from the inner wall of said peripheral rim for engaging the interior surface of the side wall of a container below the locking flange thereof, said lid being shaped to extend into the mouth of a container with said groove engaging the locking flange in a snap-on fit to produce a surface-to-surface sealing engagement between the container and said lid.

4,640,436

HERMETIC SEALING COVER AND A METHOD OF PRODUCING THE SAME

Akio Miyoshi, and Akira Fukami, both of Nishitama, Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,493
Claims priority, application Japan, Mar. 8, 1985, 60-45935
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **12 Claims**



1. A hermetic sealing cover assembly comprising:

a seal ring having a thin layer of a metal selected from the group consisting of gold, silver, platinum and palladium; and

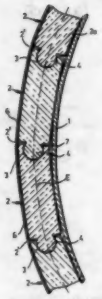
a metallic cover having a film of a material of high solderability at least on the peripheral edge of its surface facing said seal ring, said seal ring being joined to said peripheral edge of said cover in its entirely so that said layer may be bonded to said film.

4,640,437

INSULATED CONTAINER AND INSULATING ELEMENT THEREFOR

Rudolf Weingartner, Neuzeug, Austria, assignor to Kremsmunster, Austria, Austria

Filed Sep. 4, 1984, Ser. No. 647,138
Int. Cl.[4] B65D *25/36, 90/06, 90/08*
U.S. Cl. 220—400 **20 Claims**



1. An insulation for a vessel having a curved outer wall and adapted to form a sheath hugging said wall, said insulation comprising a multiplicity of elongated plates having opposite longitudinal edges, each of said plates being formed with a projection along one of said edges extending the full length thereof and with a groove along the opposite edge extending the full length thereof and shaped to receive such projection, said groove and said projection being each of cylindrical segmented configuration with said groove having an arc length greater than 180° and said projection having an arc length greater than that of said groove such that more than a semicircular arc of each projection is receivable in a groove of an adjoining plate, adjoining plates being laterally retained to one another by the formfit interengagement between projection and groove and being angularly displaced relative to one another about the centers of curvature of the respective projections at varying angles corresponding to the radius of curvature of said wall to enable a sheath of said plates to closely surround said vessel, each of said plates comprising a body of foamed thermally insulating material, the interfitting grooves and projections constituting the sole means for laterally retaining the plates together into a sheath, whereby no other means is required to retain the plates together against lateral separation.

4,640,438

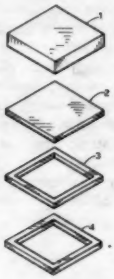
COVER FOR SEMICONDUCTOR DEVICE PACKAGES

Robert L. Trevison, Spokane, Wash.; William E. McKee, Coeur D'Alene, Id., and Larry B. Hunnel, Otis Orchards, Wash., assignors to Comienco Limited

Filed Mar. 17, 1986, Ser. No. 840,225
Int. Cl.[4] B65D *41/00*
U.S. Cl. 220—359 **19 Claims**

14. A cover for a package for semiconductor devices comprising: a cover substrate having a coating on one side thereof selected from at least one of the group consisting of gold and nickel, and a preform made of an alloy selected from the group consisting of gold-tin alloys, lead-tin alloys, lead-indium alloys, tin-silver alloys, lead-indium-silver alloys and lead-tin-silver

alloys, said preform having a coating on one side thereof of a preform alloy component having a melting point lower than



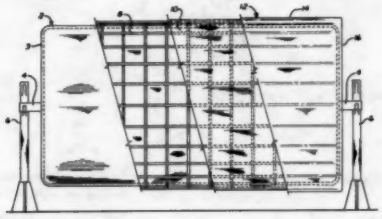
the melting point of the preform alloy, said preform being diffusion pressure bonded to the cover substrate.

4,640,439

DOUBLE WALL STORAGE TANK FOR LIQUIDS AND METHOD OF MAKING SAME

David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Filed Sep. 12, 1985, Ser. No. 775,140
Int. Cl.[4] B65D *87/24*
U.S. Cl. 220—445 19 Claims



14. A tank for storage of liquids comprising

a substantially rigid inner tank having means for introducing thereinto and withdrawing therefrom liquids to be stored;

a spacing material overlying a substantial portion of the exterior surface of said inner tank, said spacing material providing for passage of liquids along the portions of the exterior surface of said inner tank underlying said spacing material; and

a substantially rigid outer sheath formed of a resin impregnated fibrous material that is substantially liquid tight, said outer sheath enclosing said inner tank and said spacing material and having at least a portion thereof spaced from said inner tank by said spacing material;

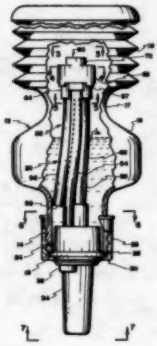
a film of imperforate material interposed between said resin impregnated fibrous mateial and said spacing material, whereby is formed a double wall tank having at least a portion of the outer sheath thereof spaced from the inner tank.

4,640,440

FOAM DISPENSING DEVICE

George W. Ford, Jr., and Darrel R. Palmer, both of Sandy, Utah, assignors to Ballard Medical Products, Midvale, Utah

Filed Apr. 12, 1985, Ser. No. 722,831
Int. Cl.[4] B67D *5/58*; B65D *37/00*
U.S. Cl. 222—190 5 Claims



1. A foam dispensing device for use in an inverted condition, comprising:

(a) an hour glass-shaped one piece container for holding foamable liquid and air having a discharge port, a reservoir portion disposed at one end of the container adjacent the discharge port, a bellows portion disposed at the other end of the container remote from the discharge port and a necked-down finger engageable portion centrally disposed between said bellows portion and said reservoir portion, said central finger engageable portion being substantially reduced in its transverse area when compared to the reservoir portion and the bellows portion,

(b) means associated with the container having air inlet passage means and foam outlet passage means, whereby air is selectively admitted into the interior of the device and foam is selectively extruded from the interior of the device,

(b1) means communicating with the reservoir portion and the bellows portion,

(c) foam producing means associated with the container and said means communicating with the reservoir portion and the bellows portion,

(d) means communicating between the foam producing means and the foam outlet means,

(e) means communicating between the air inlet means and the container air space, and

(f) valve means closing the air inlet means when pressure is applied to the bellows portion and opening the air return means when pressure applied to the bellows portion is relieved.

4,640,441

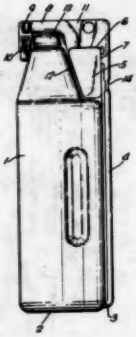
LIQUID-DISPENSING CONTAINER

Gerrit K. Bunschoten, Oud Zuilen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed May 7, 1985, Ser. No. 731,431
Claims priority, application United Kingdom, May 14, 1984, 8412297
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 4 Claims

1. A liquid-dispensing container comprising a manually deformable reservoir chamber for holding liquid, a dosage chamber, a duct extending from close to the bottom of the reservoir chamber to the dosage chamber such that liquid can be expressed from the reservoir chamber into the dosage cham-

ber by squeezing the reservoir chamber, said duct having a restriction, a discharge duct extending from the dosage chamber and defining a non-linear flow path for the liquid to be discharged, said discharge duct having a first flow channel portion extending away from said dosage chamber and a second flow channel portion inclined substantially perpendicular



to said first flow channel from which the dispensed liquid exits the discharge duct, said second flow channel oriented to permit liquid discharge therefrom in a horizontal direction relative to the reservoir chamber, and a closure seal fitted at an end of said second flow channel, all parts of the container being integrally moulded in fixed positional interrelationship.

4,640,442

DISPENSING PACKAGE AND FOLLOWER DEIVCE

James L. Drobish, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 546,344, Oct. 31, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,390

Int. Cl.[4] B65D *37/00*; B67D *5/42*

U.S. Cl. 222—209 **33 Claims**

1. An improved dispenser for a product, wherein the product is housed in an axially extending bore of a tubular container body having an upper end from which product is dispensed and an open lower end, said dispenser comprising a follower piston slidably mounted within said lower end of the bore of said body to support said product thereabove, said piston being constructed of resilient material and comprising a face portion adapted to contact the product and a peripherally attached sidewall which has at least one integral peripheral contact band conforming to the shape of the cross section of said bore, said sidewall being adapted to virtually resiliently longitudinally extend or contract in response to axial forces exerted on said face portion with such change in length resulting in an inversely proportional virtual change in lateral dimension of said peripheral contact band, said piston being hollow with the interior surfaces of said face and said sidewall exposed to atmospheric pressure, and said contact band dimensioned to provide an interference fit within the bore which exerts a predetermined normal force against the inner surfaces of said bore in static condition, whereby application of downward axial force on said piston face tends to virtually expand the lateral dimension of said peripheral contact band thereby increasing said normal force and proportionally increasing piston resistance to rearward displacement within said dispenser, and application of upward axial force on said piston face tends to virtually decrease the lateral dimension of said peripheral contact band thereby reducing said normal force and proportionally reducing piston resistance to upward displacement therein and permitting said follower piston to move upwardly within said dispenser while maintaining a seal with the inner surfaces of said bore.

4,640,443

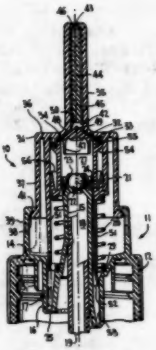
MANUALLY OPERATED DISPENSING PUMP

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 502,274, Jun. 8, 1983, Pat. No. 4,494,680, and Ser. No. 502,273, Jun. 8, 1983, Pat. No. 4,511,065, each is a continuation-in-part of Ser. No. 121,223, Feb. 13, 1980, Pat. No. 4,402,432. This application Jan. 8, 1985, Ser. No. 689,783

Int. Cl.[4] B05B *11/00*

U.S. Cl. 222—321 **23 Claims**



1. A dispensing pump comprising, a pump body adapted for fluid tight communication with the opening of a container of flowable product to be dispensed, said pump body including a stationary upstanding piston, a container vent opening, and a collar surrounding said piston, an annular plunger mounted for reciprocation on said piston to define therewith a variable volume pump chamber, said piston having an inlet passage and a coaxial valve for controlling said inlet passage, a plunger head slidably disposed on said plunger for reciprocation and having means defining a variable volume accumulation chamber in open communication with said pump chamber, means resiliently urging said plunger into a fully raised position above said pump body, said head having a discharge passage with an inlet end thereof coaxial with said piston, discharge valve support means at an upper end of said plunger confronting an upper end of said piston and complementarily contoured thereto, said support means including a discharge valve for controlling said discharge passage and having at least one passageway extending therethrough for maintaining the open communication between said chambers, retention beads on said plunger head and on said collar for limiting said plunger head in a predetermined raised position wherein said plunger closes said discharge passage in said fully raised position

thereof, said retention beads extending laterally respectively toward confronting surfaces of said collar and said plunger head, one of said beads defining a first annular bearing member in sliding engagement with one of said confronting surfaces during plunger head reciprocation, said pump body further including an upstanding annular wall spaced from said piston and therewith defining a vent chamber which includes said vent opening, a vent skirt extending from said plunger head and having an annular vent seal defining a second bearing member slidably guided along said wall during said plunger head reciprocation, said vent chamber being adapted to be closed by said vent seal in said fully raised position of said plunger and to be opened by said vent seal during plunger reciprocation, and said bearing members being spaced apart acting to resist any lateral or eccentric forces applied to said head during its reciprocation to thereby isolate said forces from said plunger permitting it to respond without restraint during said movement in opening and closing said discharge passage.

4,640,444

PUMP DISPENSER WITH SLIDABLE TRIGGER

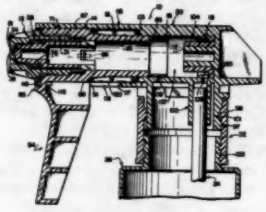
Robert L. Bundschuh, Box 4415, Miami Lakes, Fla. 33014

PCT No. PCT/US84/00839, § 371 Date Jun. 1, 1984, § 102(e) Date Jun. 1, 1984

PCT Filed Jun. 1, 1984, Ser. No. 632,083

Int. Cl.⁴ B67D *5/40*; B05B *9/43*

U.S. Cl. 222—321 **29 Claims**



1. In a manually-operated pump dispenser including a housing adapted to be coupled to a liquid-containing bottle and having a fluid passageway, a dip tube extending from the passageway into the bottle, an open-ended slot, and a vent for venting the bottle to the atmosphere; a pump member having a fluid passageway communicating with the fluid passageway in the housing, and a finger engaging trigger extending therefrom and movable in the slot, the pump member being slidably engaged with the housing and having an exit orifice; means for biasing the pump member away from the housing; and a pair of one-way valves located along the pump member and the housing fluid passageways, the improvement comprising:

cooperating, substantially planar means on said housing and said pump member for maintaining said pump member and said housing in longitudinal alignment when said trigger is engaged and said pump member is moved towards said housing,

said finger engaging trigger having a bottom edge free from engagement with said housing,

said cooperating means comprising

a substantially planar downwardly facing surface on said pump member and a substantially planar upwardly facing surface on said housing in slidable engagement with said downwardly facing surface.

4,640,445

PORTABLE AND WEARABLE INJECTOR OF MINI SIZE

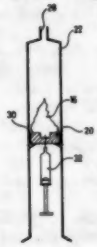
Yasuyuki Yamada, Ishikawa, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 683,811

Claims priority, application Japan, Dec. 22, 1983, 58-242364

Int. Cl.⁴ B67D *5/42*; A61M *37/00*

U.S. Cl. 222—386.5 **2 Claims**



1. A portable and wearable medical injector of mini size, which comprises an injector syringe and a gas-impermeable flexible bag received in the syringe, said syringe having one open end for injection of an infusion liquid, the other end being sealed, said bag containing therein a gas generating means comprising a chemical substance which is non-toxic to human beings and reactive with hydrogen peroxide, said bag prior to administration of infusion liquid being provided with a predetermined amount of hydrogen peroxide for reaction with the said chemical substance in the bag to produce an oxygen gas in the flexible bag for expanding the bag in the syringe to force the infusion liquid in predetermined quantities and rates over predetermined periods of time out of said open end of the syringe, said syringe being provided with a slidable element which seals its said other end, said slidable element having an extension at its bottom engageable by a tool for pulling the sealing element downwardly for filling the syringe with infusion liquid after mixture of said chemical substance with said hydrogen peroxide.

4,640,446

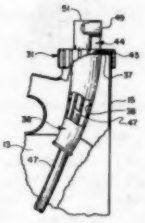
SAFETY GAS CAN WITH PLURAL, NESTABLE DISPENSING MEANS

William T. Walker, 28 Tamela Dr., Little Rock, Ark. 72207

Filed Jun. 4, 1985, Ser. No. 740,982

Int. Cl.⁴ F04F *10/00*; B67D *5/06*

U.S. Cl. 222—416 **9 Claims**



1. A fluent material storage and dispensing device, comprising in combination:

a container having enclosing walls defining an interior within which the material is to be stored,

one of the enclosing walls having a portal allowing access to the interior of said container,

first and second open tubular dispensing means together

having a single common portal-engaging fastener, wherein said common fastener is deployable on said portal to modify the manner in which the fluent material is dispensed, wherein said first dispensing means comprises a tube disposed inside said second dispensing means and extending therebelow to substantially reach the bottom of the container, and wherein said second dispensing means comprises a pour spout jacketing a portion of said first dispensing means,

and means for nesting said first and second dispensing means, one within the other, and then within said container for storage.

7. A kit with means for variably altering the flow rate of fluent material and nestable storage means for said flow altering means comprising in combination:

first and second tubular dispensing means, each dispensing means having a first and second open end, said second dispensing means having a greater cross section than said first dispensing means such that said second dispensing means can be slid over said first dispensing means concentrically,

said greater tubular second dispensing means having a radially extending end flange adapted to abut against a similar diameter flange on said inner first tubular dispensing means,

and a coupling means adapted to engage either or both flanges, respectively, for use or storage.

4,640,447

MOLTEN METAL IMMERSION POURING SPOUT

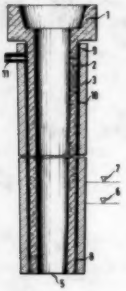
Heinrich Geller, Duisburg; Peter Nold, Rümmelshein; Heinz Schermer, Eltville, and Ortwin Rave, Wiesbaden, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 665,758

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1983, 3339586

Int. Cl.⁴ B22D *41/08*

U.S. Cl. 222—603 **12 Claims**



1. An immersion pouring spout for molten metal, comprising:

a top first part;

a cylindrically-shaped second part having an outside surface and coupled with said top first part to be operative as a pouring tube; and

a protective jacket made of a ceramic material protecting said outside surface of said second part, and cement layer means attaching said jacket to said second part such that said protective jacket extends over substantially the entire length of said second part, said cement layer means comprising a material whose thermal conductivity is less than the thermal conductivity of said pouring tube, said second part having a bottom outlet for molten metal, and with said cement layer means including a first portion positioned adjacent to said top first part and a second portion positioned adjacent to said bottom outlet such that a space is provided between said second part and said protective jacket and between said first and second portions of said cement layer means.

4,640,448

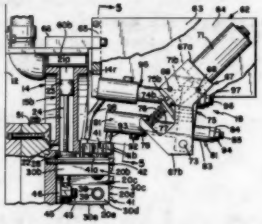
VOLUME ADJUSTMENT DEVICE FOR POWDER FILLING APPARATUS

Hans W. Trechsel, Rockford, Minn., assignor to TL Systems Corporation, Minneapolis, Minn.

Filed Jun. 24, 1985, Ser. No. 747,567

Int. Cl.⁴ G01F *11/24*

U.S. Cl. 222—636 **22 Claims**



1. Apparatus for dispensing metered quantities of a substance to sequentially moving containers, comprising:

a wheel member revolvable about a predetermined axis of rotation;

a plurality of substance dispensing devices arranged in a radial manner on the wheel member;

each dispensing device having a chamber of predetermined volume for retaining a predetermined quantity of the substance, an opening in the chamber through which the substance is received and discharged, and means for varying the chamber volume and hence the quantity of the substance received and discharged;

and means for adjusting the chamber volume varying means, comprising:

an externally accessible adjustment member operatively connected to the chamber volume varying means and movable in a first direction to increase the volume of the chamber, and movable in a second direction to decrease the volume of the chamber;

first and second actuator means selectively engagable with the adjustment member, the first actuator means constructed and arranged to move the adjustment member in said first direction upon engagement therewith, and the second actuator means constructed and arranged to move the adjustment member in said second direction upon engagement therewith.

4,640,449

HANDLE BAR MOUNTED QUICK DISCONNECT BOTTLE CAGE

James R. Blackburn, Los Gatos, Calif., assignor to Jim Blackburn Designs, Inc., Campbell, Calif.

Filed Jan. 10, 1985, Ser. No. 690,952

Int. Cl.⁴ B62J *7/00*

U.S. Cl. 224—41 **3 Claims**

1. Bottle cage apparatus for mounting to the handle bar of a bicycle proximate the goose neck thereof comprising:

means forming a bottle cage for receiving a bottle of liquid and holding said bottle forwardly of said handle bar and including at least one upstanding member disposed rearwardly of said bottle and forwardly of said handle bar when said cage is mounted to said bicycle; and

an attachment means including a bracket member having a first portion secured to said upstanding member and hav-

ing a second portion commencing at said first portion and extending over and rearwardly of said handle bar when said cage is mounted to said bicycle with a first bend of less than 180° which passes over said handle bar and thence downwardly followed by a second bend of less than 180° upwardly, such that said second portion is disposed below said goose neck at the location of said second bend, a laterally extending third portion extending from said second portion and passing upwardly over said goose neck and thence downwardly, said third portion having a third bend of substantially 180° located at approximately the mid-point of said third portion, and a forwardly extending fourth portion extending from said third portion

and including a less than 180° fourth bend upwardly such that said fourth portion is disposed below said goose neck at the location of said fourth bend followed by a less than 180° fifth bend, said fourth portion extending over said handle bar at said fifth bend and extending to a fifth portion that is attached to said upstanding member; and

a clamp means coupling said second and fourth portions at said second and fourth bends to said goose neck and including means for lockingly engaging the bottom of said goose neck enveloped by said clamp member and the portion of said bracket member forming said third bend;

whereby said apparatus may be securely attached to the goose neck and handle bar of a bicycle.

4,640,450

ROOF RACK FOR MOTOR VEHICLES

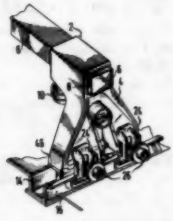
Georg A. Gallion, Wiesbaden; Dieter N. Bratke, Wallerstadten; Klaus Helbig, Russelsheim, and Karl F. Reuter, Kelsterbach, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1985, Ser. No. 735,891

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418770

Int. Cl.⁴ B60R *9/00*

U.S. Cl. 224—331 **2 Claims**



1. A roof-mounted luggage carrier for motor vehicles including a leg and clamp device adapted for attachment to a flange which is formed in a longitudinal extending channel disposed on the lateral portion of the roof, said channel being covered by a molding strip for preventing entry or dirt into the channel and being provided with a cutout for the installation of the leg and the clamp of the luggage rack, said cutout being disposed only at the place where the luggage rack is mounted to the roof, the improvement characterized in that:

a protective cap attached to the leg and having a lower edge disposed in close proximity with the roof surface, and a seal means connected to and extending downwardly from the lower edge of the protective cap and including a longitudinal extending lip which bears against the roof and transversely extending lateral lips at the front and rear of the leg extending transversely of the vehicle and sealingly engaging with the molding strip on each side of the cutout thereof, to thereby prevent entry of foreign matter into the channel through the cutout in the molding strip.

4,640,451

COMBINATION HOLE PUNCH AND STAPLER

Paul Steiner, Staad, and Bruno Stocker, Berneck, both of Switzerland, assignors to Kollektivgesellschaft Eberhard, Steiner & Dr. Stocker, Kloten, Switzerland

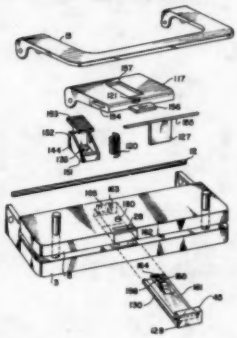
PCT No. PCT/CH83/00121, § 371 Date Jun. 26, 1984, § 102(e) Date Jun. 26, 1984, PCT Pub. No. WO84/01739, PCT Pub. Date May 10, 1984

PCT Filed Nov. 7, 1982, Ser. No. 629,830

Claims priority, application Switzerland, Nov. 8, 1982, 6461/82; May 31, 1983, 2982/83

Int. Cl.⁴ B25C *5/02*; B26F *1/36*

U.S. Cl. 227—76 **20 Claims**



10. In an organizing device for travel, office, school and the home, comprising a hold punch having a first rocking lever and at least two punches, a stapler integrated into said hole punch for stapling together documents being processed by means of an initially U-shaped staple and having a magazine for accommodating a plurality of said initially U-shaped staples and including stop means for said plurality of initially U-shaped staples, spring means for pressing said plurality of initially U-shaped staples against said stop means in said magazine, a substantially flat insertion plunger for inserting a staple of said plurality of initially U-shaped staples and bearing against the stop means into the documents being processed and a second rocking lever operatively connected with said substantially flat insertion plunger, a base pivotably connected to said first and second rocking levers and having a forming anvil for closing the legs of said staple upon a rear side of the documents being processed and at least two bores defining female die members for said punches of said hole punch, the improvement which comprises:

said magazine having a longitudinal axis and a head defining said stop means;

spring means mounted transversely to said longitudinal axis of said magazine for feeding said plurality of initially U-shaped staples sequentially arrayed in said magazine toward said head;

said magazine of said stapler being arranged in a base portion rigidly connected to said base and forming conjointly with said base a slot for accommodating documents; and

said substantially flat insertion plunger being translatably mounted transversely to an insertion direction of said plurality of initially U-shaped staples for precisely vertically guiding said substantially flat insertion plunger during the insertion of each said staple of said plurality of initially U-shaped staples into the documents.

4,640,452

DEVICE FOR DRIVING NAILS OR SIMILAR FASTENING ELEMENTS

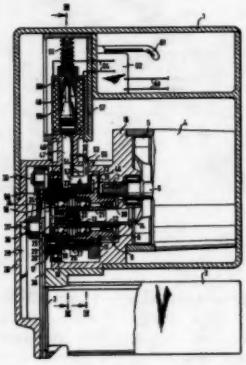
Lukas Matt, Mauren, Liechtenstein; Fritz Mark, Mäder, Austria, and Hans Gschwend, Vaduz, Liechtenstein, assignors to Hilti Aktiengesellschaft

Filed Jul. 24, 1985, Ser. No. 758,478

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427614

Int. Cl.[4] B25C *5/06, 5/15*

U.S. Cl. 227—131 11 Claims



1. Device for driving nails, staples and similar fastening elements comprises an axially extending driving member having an axially extending cylindrically shaped surface concentric with the axis thereof, a motor arranged to rotate said driving member, an axially extending driven member disposed in axial alignment with and extending axially from adjacent one end of said driving member, said driven member having an axially extending cylindrically shaped surface concentric with the axis thereof, means connected to said driven member for converting rotational movement into translational movement, clutch means for selectively interconnecting the cylindrically shaped surfaces of said driving member and said driven member for transmitting torque from said driving member to said driven member, and a relasing device for providing a limited timewise connection between said driving member and said driven member via said clutch means, said clutch means comprises an axially extending wraparound spring encircling the cylindrically shaped surfaces of said driving member and driven member and arranged to grip the cylindrically shaped surfaces of said driving member and driven member for transmitting the rotational driving motion of said driving member to said driven member.

4,640,453

APPARATUS FOR FABRICATING MULTI-LAYER SPIRAL TUBES

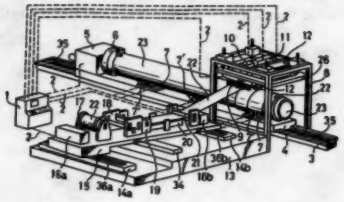
Tsutomu Oe; Shigeaki Kimura; Yoshinori Yuzaki, and Tadao Ozaki, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1985, Ser. No. 780,078

Claims priority, application Japan, Oct. 13, 1984, 59-215015

Int. Cl.[4] B23K *5/02*

U.S. Cl. 228—17.7 1 Claim



1. An apparatus for fabricating multi-layer spiral tubes, comprising first drive means for performing rotation of an inner cylinder around which a web is to be wrapped spirally, a slide base moveable along the longitudinal direction of said inner cylinder, said slide base being disposed on a bed so as to be slidable along the longitudinal direction of said inner cylinder, a plurality of pairs of cradles mounted on said slide base for placing said inner cylinder thereon, first depressing rolls for wrapping said web, second depressing rolls for constraining a weld portion of said web, an automatic gap detector for detecting a gap between adjacent edge portions of said wrapped web, an automatic welding machine for welding edge portions of said wrapped web, an automatic grinding machine for grinding excess metal of welding, an automatic defect hunter for detecting defects in the weld portion, a web feed table for feeding said web, second drive means for moving said web feed table, and a central control unit coupled to said first drive means, said cradles, said first depressing rolls, said second depressing rolls, said automatic gap detector, said automatic welding machine, said automatic grinding machine, said automatic defect hunter, said web feed table and said second drive means, to control the operations of these component means in a concentrated manner.

4,640,454

METHOD FOR PRODUCING EXTRUSION DIE FOR FORMING A HONEYCOMB STRUCTURE

Shinichi Yamamoto, Takahama; Toshihiko Ito, Nukata, and Mitsuru Asano, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 9, 1983, Ser. No. 502,656

Claims priority, application Japan, Jun. 12, 1982, 57-101083

Int. Cl.[4] B23P *17/00*; B23K *20/02, 20/14*

U.S. Cl. 228—161 6 Claims

1. A method for producing an extrusion die adapted to receive a plurality of feeds of an extrudable material, distribute and pool those feeds and extrude the distributed, pooled extrudable material as a grid,

this method comprising:

(a) providing a first metallic block having an inlet face and an outlet face separated from one another by the thickness of said first metallic block;

(b) providing a second metallic block having an inlet face and an opposite face separated from one another by the thickness of said second metallic block;

(c) forming a plurality of transversally spaced feed passages through said first metallic block, these feed passages extending at least part-way through the thickness

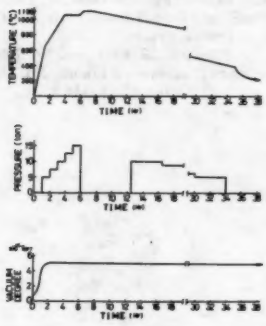
thereof so as to extend communication of the inlet face thereof towards the outlet face thereof;

(d) forming a grid network of extrusion slots in said second metallic block incompletely through the thickness thereof, from said inlet face thereof, so as to leave intact a layer of the second metallic block adjoining said opposite face thereof;

(e) forming a grid network of pooling slots in at least one of:

(i) the first metallic block incompletely through the thickness thereof from said outlet face thereof, to such depth and arrangement that each such pooling slot communicates with at least one said feed passage; and

(ii) the second metallic block incompletely through the thickness thereof from said inlet face thereof, each said extrusion slot being so located in said second metallic block so as to be capable, upon facewise juxtaposition of said first and second metallic blocks, of aligning with a respective pooling slot as a continuation thereof thicknesswise of the resulting composite and of communicating with at least one said feed passage in such a sense as to be fed thereby, and each



pooling slot being wider than each respective extrusion slot;

(f) placing said outlet face of said first metallic block in facewise juxtaposition with said inlet face of said second metallic block with respective said extrusion slots in alignment with respective said pooling slots as respective continuations thereof thicknesswise of the resulting composite, and each feed passage in communication with a plurality of said pooling slots in such a sense as to feed such pooling slots;

(g) while maintaining such juxtaposition, heating said first and second metallic blocks under such conditions as to join said outlet face of said first metallic block with said inlet face of said second metallic block as a composite block, said diffusion welding being performed in two stages within a vacuum chamber of a hot pressing device, in each of which stages said blocks are pressed together, with such pressure being relieved between said stages in order to prevent excessive deformation of said blocks; and

(h) thereafter, severing said intact layer from said second metallic block thereby defining an outlet face of the composite block, through which face said extrusion slots open as a grid.

4,640,455

METHOD OF MAKING A METAL SEAL FOR FLANGED JOINTS AND A SEAL MADE BY SAID METHOD

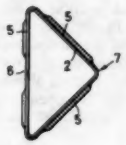
Lutz Grein, and Günter Matthiensen, both of Hanau, Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 511,309, Jul. 6, 1983, abandoned. This application Apr. 1, 1986, Ser. No. 846,835

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225361

Int. Cl.[4] B23K *31/08*

U.S. Cl. 228—176 **3 Claims**



1. A method of making a closed-figure metal seal for a flanged joint, comprising:

bending a length of metal bar along its length into a closed figure corresponding to the figure of the flanged joint, the metal bar having a cross section profiled generally in the shape of a keyhole with a thicker portion on one side for forming a sealing bead in the flanged joint in use and a thinner portion of elongated cross section on the other side for stiffening the metal bar;

uniting ends of the metal bar to close the figure of the metal seal;

mounting the metal bar on one of the flanges of the flanged joint with adhesive on the thinner portion of the metal bar and without adhesive on the thicker portion of the metal bar, whereby leaks form later dissolving thereof are avoided; and

sealingly compressing the thicker portion of the metal bar in the flanged joint as the sealing bead.

4,640,456

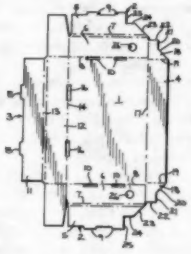
ONE-PIECE FOLDED BOX CONSTRUCTION HAVING A HINGED WALL

Ralph E. Stacey, Augusta, Mich., assignor to Green Bay Packaging Inc., Green Bay, Wis.

Filed Oct. 17, 1985, Ser. No. 788,390

Int. Cl.[4] B65D *5/22*

U.S. Cl. 229—122 **3 Claims**



1. A box construction, comprising a bottom wall, a pair of first walls extending upwardly from opposed edges of said bottom wall, each first wall including an outer section and an inner section, said sections disposed flatwise in relation to each other, a second wall extending upwardly from said bottom

wall and having means connecting corresponding first ends of said first walls, a third wall hinged to said bottom wall and movable between an open position where said third wall is substantially flush with said bottom wall to a closed position where said third wall is normal to said bottom wall and connects corresponding ends of said first walls, said third wall when in said open position constituting an extension to said bottom wall whereby articles contained in said box can be slid across said bottom wall and across said third wall, a flap pivotally connected to each end of said third wall, each flap disposed generally normal to said third wall and lying in a common plane with the inner section of the respective first wall, a first abutment on the inner section of each first wall, a second abutment on each flap and engageable with the respective first abutment, the outer section of each said first wall having an opening disposed in alignment with the respective flap when said third wall is in the closed position, insertion of an object through said opening acting to pivot said flap inwardly to release engagement of said abutments and enable said third wall to be pivoted to the open position.

4,640,457

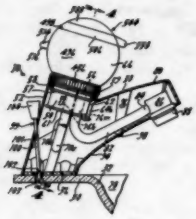
THERMOSTATIC VALVE ASSEMBLY

Robert D. MacDonald, Mesa, Ariz., assignor to Masco Corporation, Taylor, Mich.

Division of Ser. No. 354,241, Mar. 3, 1982, Pat. No. 4,458,839. This application Feb. 27, 1984, Ser. No. 583,758

Int. Cl.[4] G05D *23/185*

U.S. Cl. 236—12.11 **31 Claims**



1. A thermostatically regulated valve assembly comprising:
a valve body;
an internal cavity in said valve body;
a hot water passageway extending through said valve body from said cavity to an inlet capable of being interconnected with a source of pressurized hot water;
a cold water passageway extending through said valve body between said cavity and an inlet capable of being interconnected with a source of pressurized hot water;
a mixed water discharge passageway extending through said valve body between said cavity and a discharge outlet on an exterior surface of said body;
a valve member disposed within said cavity and moving therein between two extreme positions in said cavity along a predetermined path,
a watertight seal between a surface of said cavity and a surface of said valve member whereby said valve member divides said valving cavity into two chambers, said valve member moving at least partly into one of said chambers in each of said extreme positions;
proportioning valve means on said valve member for selectively regulating the relative amounts of hot and cold water flowing from said hot and cold water passageways to said mixed water discharge passageway, said proportioning valve means varying said relative amounts of hot and cold water as said valve member is moved along said path;
first auxiliary passageways interconnecting an upstream portion of said discharge passageway with a respective one of said chambers;
second auxiliary passageways interconnecting a respective one of said chambers with a downstream portion of said discharge passageway;
thermostat means in said discharge passageway, said thermostat means measuring the temperature of water in said discharge passageway and moving in response to a deviation in water temperature from a selected temperature;
secondary valve means disposed along each of said second auxiliary passageways and actuated by the movement of said thermostat means to selectively open and close said passageways in response to the temperature measured by said thermostat means; and
whereby, in response to a deviation in the temperature of the water in the discharge passageway from the preselected temperature, said thermostat means actuates said secondary valve means to temporarily close one of said second auxiliary passageways and thereby causes a temporary increase in pressure in one of the chambers, said pressure change causing said valve member to move along said path towards the other of said chambers and to thereby alter relative flow rates of hot and cold water into the discharge passageway to produce the preselected temperature of water in the discharge passageway.

4,640,458

METHOD OF PRODUCING HOT AIR AND HOT WATER FOR SANITARY PURPOSES AND APPARATUS FOR CARRYING OUT THE SAID METHOD

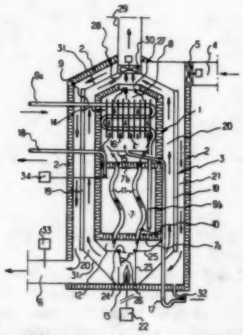
Yves Casier, Ermont; Philippe Cassagne, Paris; Sylvain Gicquel, Saint Denis, and Roland Junet, Paris, all of France, assignors to Gaz de France, France

Filed Jul. 18, 1985, Ser. No. 756,312

Claims priority, application France, Jul. 25, 1984, 84 11816

Int. Cl.[4] F24H *3/06*

U.S. Cl. 237—17 **5 Claims**



1. An apparatus for producing hot air and hot water for the supply of sanitary fittings, comprising the combination of:
a heat-insulated central portion or casing (**1**) for the heating of sanitary water, including a water storage tank (**7**) and a chamber (**8**) located above said tank which comprises a lower portion (*7a*) and an upper portion (*7b*) above which said chamber is situated;
a first exchanger (**10**) located in said tank and including sinuous tube means (**11**) which opens at the upper portion (*7b*) of said tank into said chamber;
a pre-exchanger (**14**) disposed inside said chamber and a cold-water intake tube (**9**) associated with said pre-exchanger, extending through said chamber and opening into said tank;
a heat-insulated external casing (**2**) completely surrounding the central portion of the apparatus and defining therewith an annular space (**3**) which contains a second exchanger (**19**) including a finned wall arranged concentri-

cally around said central portion and forming a first annular passageway (20) between said finned wall and said central portion (1), and a second annular passageway (21) between said wall and said external casing (2);

duct means (4,6) connected to said external casing and adapted to blow air through said second passageway (21);

a burner (13) and a conduit (23) associated with said burner and communicating with said tube means, for conveying the combustion gas through said sinuous tube means (11) inside said tank and through said chamber (8) above said tank;

flap means (26) hinged onto said conduit (23) for directing the combustion gas either towards said sinuous tube means and chamber for heating the stored water or towards said first passageway (20) for heating the blown air passing through said second passageway (21) by counterflow heat exchange with the combustion products flowing in said first passageway; and

openings (27,28) provided in said chamber (8) and said first passageway (20) respectively, for discharging the combustion gas flowing either through said central portion (1) or through said first passageway (20).

4,640,459

DUAL RAILS FOR ROLLER PALLETS

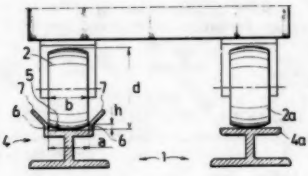
Kalevi Hetemaa, Helsinki; Esko Naumanen, Hyvinkää, and Frans Vainio, Helsinki, all of Finland, assignors to Elevator GmbH, Baar, Switzerland

Continuation of Ser. No. 445,505, Nov. 30, 1982, abandoned. This application Dec. 26, 1984, Ser. No. 685,221

Claims priority, application Finland, Nov. 30, 1981, 813832

Int. Cl.[4] E01B *5/02*

U.S. Cl. 238—122 **5 Claims**



1. Dual rails for a rail transportation system for use with roller pallets having two pairs of supporting wheels and for which at least one of the wheel pairs are swivelable and permit the roller pallets to be moved in either direction on the rails, which rails comprise:

one rail having an upper running surface and being provided on the margins of the upper running surface with dual upwardly pointing low steering flanges having spacing between the flanges slightly greater than the breadth of the wheels traveling on the rail, and on the upper margin of each steering flange is provided a wheel positioning flange pointing outward at an angle of about 45° for guiding a swiveled wheel to between the steering flanges; and one other rail horizontally spaced apart from said one rail and having a substantially flat upper running surface, said flat running surface being wider than the running surface of said one rail and having a width sufficient to permit swiveling of the wheel traveling thereon without it falling off the flat running surface of the other rail, whereby the roller pallets can travel in either direction on the dual rails.

4,640,460

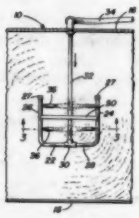
CO_2 SNOW FORMING HEADER WITH TRIPLE POINT FEATURE

Paul R. Franklin, Jr., P.O. Box 37978, Jacksonville, Fla. 32236

Continuation-in-part of Ser. No. 702,888, Feb. 19, 1985, abandoned. This application Oct. 7, 1985, Ser. No. 785,019

Int. Cl.[4] F25J *1/00*

U.S. Cl. 239—2.2 **3 Claims**



3. The method of forming maximum CO_2 snow in a vented receptacle for CO_2 snow comprising the steps of providing a pair of substantially equal rate discharge CO_2 snow forming nozzles including inlet and outlet ends, supporting said nozzles in spaced apart relation with said outlet ends opposing and aligned with each other, and simultaneously supplying liquid CO_2 under pressure to said inlet ends through a supply pipe for simultaneous discharge of CO_2 from the outlet ends of said nozzles and opposing impact of the discharge of CO_2 from said outlet ends in an impact area centrally between said nozzles and with an intermediate length portion of said supply pipe passing centrally through said impact area, supplying pressurized liquid CO_2 to said inlet ends at approximately 300 psi, said step of supporting said nozzles in spaced apart relation including supporting said nozzles with the outlet ends thereof spaced approximately 12½ inches apart.

4,640,461

FOAM-APPLYING NOZZLE

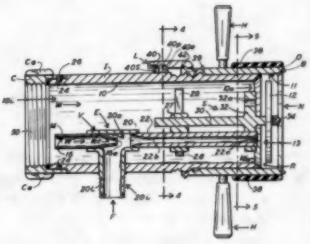
Leslie P. Williams, Port Neches, Tex., assignor to Cause Consequence Analysis, Inc., Port Neches, Tex.

Continuation of Ser. No. 399,112, Jul. 16, 1982, abandoned. This application Aug. 1, 1985, Ser. No. 762,019

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] B05B *7/26, 7/30, 7/06*; A62C *35/00*

U.S. Cl. 239—317 **8 Claims**



1. A nozzle assembly for applying a foam made up from a supply of a foam-forming liquid composition and a flowing liquid stream, comprising:

an inner barrel having an axial bore with an inlet for receiving a liquid stream under pressure and an outlet for discharging the liquid stream therefrom;

flow regulating nozzle means mounted in said outlet for

regulating the lateral extent of the stream discharged from the inner barrel;

eductor means with said inner barrel having means for receiving a portion of the liquid flowing through said inner barrel to create a reduced pressure in the eductor means;

foam-forming inlet means mounted with said eductor means for introducing a foam-forming composition into said eductor means as a result of the reduced pressure therein;

a mixing passage between said eductor means and said flow regulating nozzle means; and

said eductor means having a discharge opening into said mixing passage in proximity to said outlet of said inner barrel for mixing by an outward deflection with respect to said inner barrel, the foam-forming composition and said portion of said fluid stream flowing through said eductor means, with the remaining liquid stream from the inner barrel prior to discharge from said nozzle assembly, whereby a foam is created, with substantially the full velocity and volume of a liquid stream, to allow the foam to be propelled from the nozzle with a maximum distance of ejection and volume output.

4,640,462

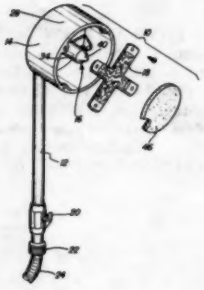
WATER DRIVEN SHOWER MASSAGER

R. Dewey Stearns, III, 323 River, Northville, Mich. 48167

Filed Jun. 10, 1985, Ser. No. 742,774

Int. Cl.[4] B05B *1/34, 3/06;* **A01G** *27/00;* **B05C** *1/00*

U.S. Cl. 239—383 **18 Claims**



1. A water driven cleansing device comprising:

a housing having a generally opened end,

a spindle assembly rotatably within said housing about an axis of rotation, said spindle having a water discharge nozzle which rotates with said spindle assembly and which discharges water along a path which is offset from said axis of rotation of said spindle assembly, said spindle assembly further having a center of mass offset from said axis of rotation due at least in part to the location of said nozzle with respect to said spindle assembly. and

means for conducting water to said spindle assembly such that water is discharged from said nozzle causing said spindle assembly to rotate within said housing, said rotation causing said cleansing device to vibrate and causing said device to emit a stream of water from said housing opened end.

4,640,463

APPARATUS FOR INJECTING LIQUID HYDROCARBON FEED AND STEAM INTO A CATALYTIC CRACKING ZONE

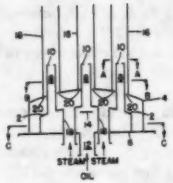
Frederick J. Krambeck, Cherry Hill; Stephen J. McGovern, West Deptford Township, Gloucester County, both of N.J., and John E. Sauer, Washington Crossing, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 572,039, Jan. 19, 1984, Pat. No. 4,555,328.

This application Aug. 30, 1985, Ser. No. 770,940

Int. Cl.[4] B05B *7/00*

U.S. Cl. 239—424 **10 Claims**



1. A nozzle apparatus for injecting a liquid hydrocarbon feedstock into a catalytic conversion zone which comprises:

(a) at least two confined passageways arranged to provide parallel fluid flow;

(b) a first flow restriction means concentric with an affixed to the downsteam end of each confined passageway;

(c) at least two annular passageways, each of said annular passageways having a detached confined passageway extending longitudinally through a portion thereof in concentrically spaced relationship

(d) a second flow restriction means concentric with and affixed to the upstream end of each annular passageway; and

(e) a third flow restriction means wherein said confined passageways communicate with each other at the upstream end by means of a first common flow space defined at the downstream end of said first common flow space by said third flow restriction means, said first common flow space containing therein means for deflecting said liquid hydrocarbon feedstock entering said first common flow space.

4,640,464

ROLLER MILL CONTROL SYSTEM

Richard L. Musto, Homewood, and Mark R. Dunn, Wilmette, both of Ill., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 7, 1984, Ser. No. 669,145

Int. Cl.[4] B02C *25/00*

U.S. Cl. 241—34 **6 Claims**

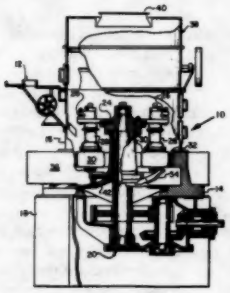
1. In the combination of a roller mill operative for grinding material therewithin and feeder means operative for feeding to the roller mill the material to be ground therewithin, the roller mill including a mill motor for driving the roller mill and a classifier for classifying material ground in the roller mill, the improvement comprising a control system for effecting control over the rate of feed of material to the roller mill in accordance with the rate of output of ground material being demanded from the roller mill, said control system comprising: to the

a. demand sensing means mounted in juxtaposed relation to the path of flow of ground material being discharged from the roller mill in the form of output therefrom, said demand sensing means including sensing means and a fuel indicating controller connected in circuit relation wilh said sensing means and having a manually set set point, said sensing means being operative to sense the output of ground material being demanded from the roller mill, said fuel indicating controller being operative to generate a signal representative of the output of ground material

being demanded from the roller mill as sensed by said sensing means;

b. feed control means operative for controlling the rate of feed of material to the roller mill, said feed control means being connected in circuit relation with said demand sensing means for receiving said signal from said fuel indicating controller, said feed control means in response to said signal received thereby from said fuel indicating controller being operative to effectuate any changes in the rate of feed of material to the roller mill that may be required in order to conform the rate of feed of material to the roller mill to the rate of output of ground material being demanded from the roller mill as changes occur in the rate of output of ground material being demanded from the roller mill;

c. airflow measuring means operative to measure the airflow through the roller mill, said airflow measuring means including interconnected in circuit relation one with another a roller mill airflow sensor and a pressure transmitter and an airflow indicating controller having a self-corrected set point and a control linkage and a fan damper and linearization means, said airflow measuring means being connected in circuit relation with said demand sensing means for receiving said signal from said fuel indicating controller, said airflow measuring means in response to said signal received thereby from said fuel indicating controller being operative through the manipulation of said control linkage and said fan damper to effectuate as established by said airflow indicating controller any changes in the amount of airflow through the roller mill that may be required in order to maintain the desired air-to-solids ratio in the roller mill as changes occur in the rate of output of ground material being demanded from the roller mill that result in changes being made by said feed control means in the rate of feed of material to the roller mill;



d. pressure measuring means operative to measure the differential pressure across the roller mill, said pressure measuring means including interconnected in circuit relation one with another a roller mill pressure sensor and a pressure transmitter and a pressure indicating controller having a self-correcting set point and linearization means, said pressure measuring means being connected in circuit relation with said demand sensing means for receiving said signal from said fuel indicating controller, said pressure measuring means in response to said signal received thereby from said fuel indicating controller being operative to effectuate as established by said pressure indicating controller any changes in the value of the differential pressure across the roller mill that may be required in order to maintain the desired differential pressure across the roller mill as changes occur in the rate of output of ground material being demanded frmom the roller mill;

e. mill motor control means operative for controlling the speed of the mill motor;

f. classifier control means operative for controlling the mode of operation of the classifier; and

g. feed forward circuit means including differentiation means and summation means, said feed forward circuit means being connected in circuit relation with said mill motor control means and said classifier control means such that said summation means is connected in circuit relation with both said mill motor control means and said classifier control means and said differentiation means is connected in circuit relation with said summation means and therethrough to said mill motor control means and said classifier control means, said feed forward circuit means further being connected in circuit relation with said demand sensing means for receiving said signal from said fuel indicating controller, said feed forward circuit means being operative when said signal evidences the occurrence of a rapid change in demand per unit time of the output of ground material beind demanded from the roller mill to effectuate as established by said differentiation means and said summation means an anticipation and modulation of the speed of the mill motor as well as the operation of the classifier to prevent the roller mill from being subjected to a condition wherein there occurs either an overfeeding of the roller mill or an underfeeding of the roller mill relative to the rate of feed of material to the roller mill that is required in order to conform the rate of feed of material to the roller mill to the rate of output of ground material being demanded from the roller mill.

4,640,465

CHOPPER FOR GARDEN REFUSE OR THE LIKE

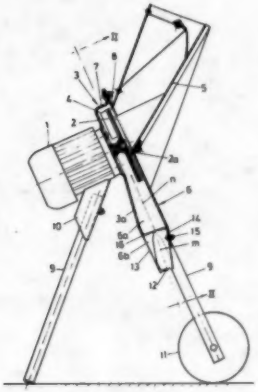
Dieter Schmid, Augsburg, Fed. Rep. of Germany, assignor to Lescha Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,456

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 8508739[U]

Int. Cl.⁴ B02C *18/22*

U.S. Cl. 241—37.5 **17 Claims**



1. A chopper for refuse comprising a housing defining a chamber, a cutting rotor mounted rotatably in said chamber for turning in a cutting plane about an axis of rotation, an inlet passage mounted on said housing so that a longitudinal axis of said inlet passage is at an angle to the cutting plane, said housing further having an ejection passage and a tubular extension running out generally radially from said axis of rotation and constituting at least part of said ejection passage, said tubular extension having a substantially unimpeded internal cross section that firstly increases and then decreases in a direction

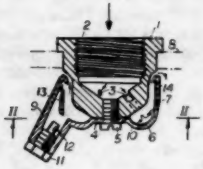
away from said rotor to impede a user from inserting his hand into the ejection passage.

4,640,466

CONTAMINANTS BREAKING AND SEPARATION

Semyon Fishgal, 1908-35 High Park Ave., Toronto, Canada M6P 2R6

Filed Apr. 1, 1985, Ser. No. 718,570
Int. Cl.[4] B02C *19/06*
U.S. Cl. 241—40 **7 Claims**



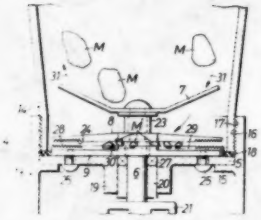
1. A device for breaking down contaminants existing within a liquid, including
a reservoir of the liquid;
a pressure line of the liquid;
a nozzle having an inlet and an outlet communicating respectively with said line and reservoir;
a stand-off obstacle facing the outlet;
a hydrocyclone provided with a drain vent for removal of the contaminants from the liquid.

4,640,467

KITCHEN UTENSIL

Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Aichi, Japan

Filed Jul. 16, 1985, Ser. No. 755,519
Claims priority, application Japan, Jan. 29, 1985, 60-15075
Int. Cl.[4] A47J *43/046*
U.S. Cl. 241—152 R **8 Claims**



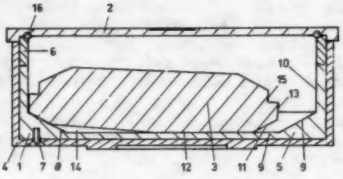
1. A kitchen utensil for obtaining juice comprising:
a main body with a built-in motor;
a vessel removably mounted on said main body for receiving therein a juice material to be treated;
a rotary shaft which is connectable to and driven by said motor and which is rotatably supported by a bottom plate of the vessel;
a pre-treatment rotary blade secured for integral rotation to a part of said rotary shaft which is located in said vessel, said pre-treatment rotary blade applying a pre-treatment to said juice material and concurrently generating a circulating flow of the material within the vessel;
a first grinder member secured to said rotary shaft below said rotary blade and within sjaid vessel, the first grinder member having a grinding surface on one side surface thereof extending over substantially an entire area in a radial direction around the rotary shaft; and
a second grinder member secured to said bottom plate and having a grinding surface provided on one side surface thereof so as to oppose said grinding surface of the first grinder member;
wherein the grinding surfaces of the first and second grinder members cooperate with each other to apply a grinding treatment in a repeated manner to the juice material which circulates in said circulating flow within said vessel.

4,640,468

DISC PULVERIZER

Bevan P. Quinn, Labtechnics Australia, P.O. Box 318, Glenside, South Australia, Australia 5065

Filed Jul. 22, 1985, Ser. No. 757,638
Claims priority, application Australia, Jul. 31, 1984, PG6297
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—199.1 **17 Claims**



1. A laboratory rock grinder head, comprising:
a bowl and a loose grinder disc movable within the bowl, the disc being smaller than the bowl and eccentrically movable within the bowl as the bowl is agitated, the bowl defining a substantially cylindrical internal shape, the bowl having a sloping shaped surface between an internal side and internal base of the bowl, and the disc having a generally cylindrical shape with an angled edge, the angled edge of the disc being complementary with the internal side and internal base of the bowl, such that a varying gap between the disc and bowl occurs under the disc as the disc is moved eccentrically in the bowl and as the disc rides up on the shaped surface of the bowl, and the angled edge of the disc rests squarely against the internal shape of the bowl.

4,640,469

SYSTEM FOR ROLLING AND UNROLLING A GROUND COVER

Charles Mackintosh, 3838 Oakwood Ave., Los Angeles, Calif. 90004

Continuation-in-part of Ser. No. 656,330, Oct. 1, 1984, abandoned. This application Aug. 15, 1985, Ser. No. 766,425
Int. Cl.[4] B65H *16/00, 18/10*
U.S. Cl. 242—55 **10 Claims**

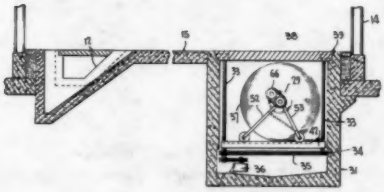
1. A system for tightly rolling up a web covering a surface with one end of the web anchored to said surface, comprising a core about which the web is rolled,
means for rolling up the web into a roll about said core from the other end thereof in the direction of said one end, and
means for tightening the roll turns about one another during roll-up,
said tightening means comprising a closed-ended tube of flexible and unstretchable material partially filled with a fluid,
said tube having a length substantially equal to the width of said web,
said tube underlying the roll for supporting the same above the web which covers the surface, and
said tube being in an intitial position beneath the roll such that the central axis of the tube is spaced in said direction from the central axis of the roll, and

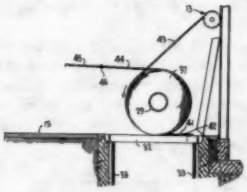
said tube being in a normal position beneath the roll such that said central axes lie in a plane perpendicular to the web which covers the surface,

whereby during a rolling up of the web said tube shifts by rolling on itself from said initial to said normal positions for causing said roll to slip to thereby tighten the web, whereafter said tube rolls on itself in said direction together with the roll and serves to maintain a tight web.

6. A system for unrolling a web without bulging from a wound web roll for covering a surface with one end of the web anchored thereto, comprising,

a core about which the web is rolled, said core including an outwardly extending axle,





a plurality of spaced straps disposed between individual turns of said wound web roll in the same direction of web winding,

means for unwinding said straps from their wrapped condition to effect an unrolling of the web from said wound web roll,

a gear motor operatively coupled with said axle, and means for powering said motor,

said powering means being disconnected during unrolling whereby said motor serves (to retard rotation of said axle against unrolling to thereby effect a tightening of the web during unrolling.

4,640,470

MAGNETICALLY ACTUATED LINE FEATHERING SYSTEM FOR SPIN CAST REELS

Steven W. Ohler, Cincinnati, Ohio, assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 5, 1985, Ser. No. 720,604
Int. Cl.⁴ A01K *89/01*
U.S. Cl. 242—84.2 A **17 Claims**

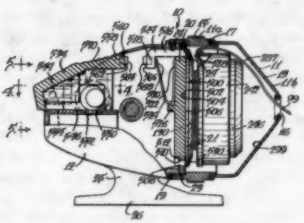
1. In a fishing reel of the type having a housing, a reel body with a deck plate, a line-carrying spool, a spinner head assembly mounted forwardly of the deck plate and means for operating the spinner head assembly to direct line onto the spool during line retrieval, line feathering structure comprising:

a feathering element;

means mounting the feathering element movably relative to the deck plate; and

means for directing at least a portion of the feathering element towards the spinner head assembly so that the line can be trapped between the feathering element and the spinner head assembly during a cast,

said means for directing the feathering element towards the spinner head assembly comprising a button on the reel and magnetic means on each of the feathering element and button, said magnetic means on the feathering element and



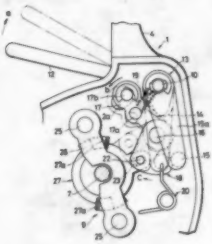
button being mutually repulsed by a magnetic force so that the feathering element is biased towards the spinner head assembly by said magnetic force.

4,640,471

CLUTCH RELEASING AND BRAKING MECHANISM FOR FISHING REEL

Hideo Murakami, and Takehiro Kobayashi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Aug. 17, 1984, Ser. No. 641,546
Claims priority, application Japan, Aug. 18, 1983, 58-128237[U]; Jun. 1, 1984, 59-82236[U]
Int. Cl.⁴ A01K *89/015, 89/02*
U.S. Cl. 242—84.53 **7 Claims**



1. A below-the-rod double-bearing type fishing reel comprising:

a reel housing;

a reel frame within said housing;

an operating lever extending forwardly and externally of said housing and rotatably mounted within said housing on an upper portion of said frame;

a cam portion within said housing, said cam portion rotatable with said operating lever around a pivot point of said operating lever;

a spool rotatably mounted on said frame;

brake means for reciprocatingly moving into and out of engagement with said spool to brake and release, respectively, said spool; said brake means being positioned within said housing and in proximity to said cam portion such that rotation of said cam portion in a first direction actuates said brake means to cause it to brake said spool;

a first clutch lever rotatable with said operating lever and joined to said operating lever at said pivot point;

a first pin within said housing and affixed to an end of said first clutch lever opposite said pivot point; and

clutch means within said housing and operable by movement of said first pin;

wherein said operating lever is fixed to a shaft which constitutes said pivot point, said shaft being rotatably mounted on said frame in said housing, and wherein said first clutch

lever is fixed to said shaft for rotation with said operating lever;

wherein said clutch means comprises a second clutch lever rotatably mounted at one end and having a free end positioned to abut said first pin, a second pin fixed to said free end of said second clutch lever, a rotatably mounted clutch plate having an arm having an elongated hole therein in which said second pin is inserted, an operating plate disposed in abutment with cam portions of said clutch plate, said operating plate being moved in the axial direction of said spool upon rotation of said clutch plate caused by rotation of said second clutch lever, and spring means for biasing said operating plate in an axial direction;

wherein said brake means comprises a brake lever having one end rotatably mounted about a fixed point in said housing, a brake shoe coupled to a free end of said brake lever, and a spring for rotatably urging said brake lever into engagement with said cam portion; and

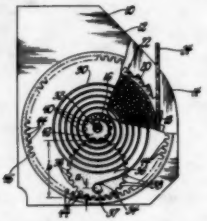
wherein said second clutch lever and said brake lever are rotatably mounted about the same point.

4,640,472

TORQUE COMPENSATING SPRING ARRANGEMENT FOR SEAT BELT RETRACTOR

Peter C. Epple, Russelsheim/Konigstadten, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1985, Ser. No. 808,062
Int. Cl.[4] B65H *75/48*
U.S. Cl. 242—107 **3 Claims**



2. A winding spring arrangement for a seat belt retractor having a belt reel rotatably mounted on a housing by a reel shaft for a plurality of revolutions to wind and unwind the belt relative the reel comprising:

a sun gear carried by the reel shaft;

a ring gear fixedly mounted on the housing and encircling the sun gear;

a planetary gear interposed between and meshing with the sun gear and the ring gear and having a diameter selected relative to the diameters of the sun gear and the ring gear to effect revolution of the planetary gear less than a full revolution during the plurality of revolutions of the sun gear during belt winding and unwinding; and

a spirally wound spring having a first end mounted on the reel shaft and a second end mounted on the planetary gear at a point thereon which migrates in the belt unwinding direction of reel rotation from a point thereon diametrically most opposite to the sun gear to a point closest adjacent the sun gear so that the second end of the spring chases the first end of the spring during belt unwinding rotation and also acts through the planetary gear to provide a progressively effective force on the shaft counteracting the torque of the spirally wound spring.

4,640,473

MAGNETIC TAPE CASSETTE WITH IMPROVED GUIDE ROLLER MEANS

Kazunori Aoyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 31, 1986, Ser. No. 824,829
Claims priority, application Japan, Mar. 27, 1985, 60-43076[U]
Int. Cl.[4] B65H *27/00*; G11B *23/04*
U.S. Cl. 242—197 **12 Claims**

1. A magnetic tape cassette having at least one guide means for contacting and guiding a magnetic tape while rotating, said guide means comprising:

a shaft (8);

a guide roller (2) rotatably mounted on said shaft, said guide roller have at least one axial end face (6);

at least one annular seat (9) for supporting said end face of said guide roller; and

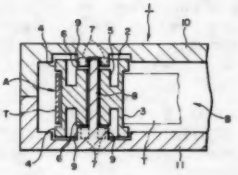
at least one rib (7) integral with and extending radially inwardly between said seat and said shaft for conveying lubricant flowing downwardly between said shaft and said roller outwardly along said rib to said seat to reduce frictional resistance between the end face and the seat and to attendantly reduce wear.

4,640,474

METHOD AND APPARATUS FOR AERIALLY TRANSPORTING LOADS

Robert A. Manseth, P.O. Box 9, Florence, Oreg. 97439

Filed Aug. 5, 1985, Ser. No. 762,771
Int. Cl.[4] B64B *1/70*
U.S. Cl. 244—31 **2 Claims**



1. A method of aerially transporting loads between a loading site and a discharging site, comprising the following steps:

loading an inflated lift balloon with ballast at the discharging site;

propelling the ballasted balloon to the loading site;

suspending a load from the balloon at the loading site;

removing ballast from the balloon at the loading site;

moving the removed ballast to the discharging site;

propelling the balloon with its suspended load to the discharging site;

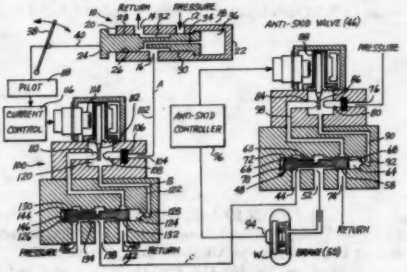
reballasting the balloon with the removed ballast at the discharging site; and

discharging the load from the ballasted balloon at the discharging site.

4,640,475
AIRCRAFT WHEEL BRAKE CONTROL SYSTEM AND METHOD

Melvin C. Zoerb, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 24, 1984, Ser. No. 685,298
Int. Cl.[4] B60T 8/02; B64C 25/42
U.S. Cl. 244—111 31 Claims



1. An aircraft wheel brake controlling system, comprising:

a first stage metering valve including a first port control member, a pressure port, a return port and an output port;

pilot operated foot control means for moving the first port control member in a pressure port opening first direction;

a second stage metering valve having an inlet port, an outlet port and pressure control means between such ports;

first conduit means connecting the output port of the first stage metering valve to the input port of the second stage metering valve;

a third stage metering valve comprising a second port control member, a pressure port, a return port, a brake port and a command pressure chamber at one end of the second port control member;

second conduit means connecting the output port of the second stage metering valve to the command pressure chamber of the third stage metering valve;

third conduit means connecting the pressure port of the third stage metering valve to the source of supply pressure;

fourth conduit means connecting the return port of the third stage metering valve to return pressure;

fifth conduit means connecting the brake port of the third stage metering valve to an aircraft wheel brake;

wherein the first stage metering valve has an off position in which there is no foot pedal force on the first port control member and such first port control member is positioned to block the pressure port and to communicate the outlet port with the return port;

wherein a pilot foot force supplied to the foot control means depresses the first port control member so that it in turn meters flow from the pressure port to the output port in proportion to displacement of the first port control member;

wherein said third stage metering valve has an off position in which the second port control member is positioned to block the pressure port and communicate the brake port with the return port;

wherein a pilot applied foot force on the foot control means, for causing the first port control member to meter pressure through the first stage metering valve, results in the delivery of a command pressure to the command pressure chamber of the third stage metering valve, via the second stage metering valve, and this causes the second port control member to move and meter pressure and flow through such third stage metering valve in an amount proportional to the displacement of the second port control member;

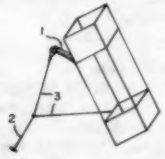
wherein said third stage metering valve includes feedback means for feeding brake pressure in the fifth conduit means to the second port control member, to exert a force on such second port control member opposite to the command pressure force, for moving the second port control member into a null position in response to the pressure build-up in the brake; and

said first stage metering valve including feedback means for delivering a feedback pressure signal from the first conduit means to the first port control member, for exerting a force on such first port control member opposite to the pilot applied foot force, for moving the first port control member to a null position in response to a pressure increase in said first conduit means.

4,640,476
AUTOMATIC ATTITUDE ADJUSTER FOR KITE

Charles O. Meckley, 29520 SW. 199th Ave., Homestead, Fla. 33030

Filed May 28, 1985, Ser. No. 738,368
Int. Cl.[4] B64C 31/06
U.S. Cl. 244—155 R 5 Claims

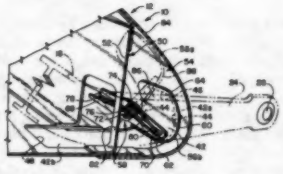


1. An automatic adjuster for a kite comprising a strip of flexibly bendable material which has a memory, said strip having a first end which is adapted to be firmly connected to a portion of a kite assembly, said portion being rigid when the kite is in flight, and said strip having a second end adapted to be connected to a kite bridle so that when the strip is connected and a force is applied between the bridle and said strip said strip bends in response to the applied force.

4,640,477
CLOSING DEVICE FOR AN AIRFOIL

James W. Pace, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1984, Ser. No. 687,929
Int. Cl.[4] B64C 3/50, 1/38
U.S. Cl. 244—214 18 Claims



1. In an airfoil where there is a leading edge structure having a front skin section and a leading edge device having a cruise position covering said front skin section, and a deployed position where said front skin section is exposed to airflow, said airfoil having a spanwise axis, a chordwise axis and a vertical axis, said airfoil having a connecting member extending between said leading edge structure and said leading edge device, said front skin section having a front opening through which said connecting member extends, said airfoil being characterized in that during movement of said leading edge device to its deployed position, said connecting member has a component of motion in said opening generally transverse to said chord-

wise axis to a transversely displaced position, so as to leave a portion of said opening as an exposed front skin open area, an improvement to close said exposed front skin open area when the connecting member is in its transversely displaced position, said improvement comprising:

a. a door having a surface configuration generally matching said exposed front skin open area;

b. a pivot mounting device by which said door is pivotally mounted in said leading edge structure for movement about an axis of rotation having a substantial alignment component generally perpendicular to a portion of said front skin section adjacent to said exposed front skin open area, and substantial alignment components parallel to a plane of movement through which said connecting member moves from its first position to its second position, said mounting device being characterized in that said door has a first retracted position where said door is removed from said exposed front surface open area and displaced about said axis of rotation from a position occupied by said connecting member in its retracted position, and a second deployed position where said door is positioned in said plane of movement and closes at least a portion of said exposed front surface open area;

c. means to cause said door to move between its retracted and deployed positions.

4,640,478

QUICK CONNECT CYLINDER MOUNT STRUCTURE

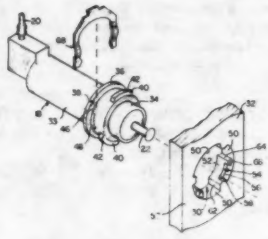
Keith V. Leigh-Monstevens, Troy, Mich., assignor to Automotive Products plc, Warwickshire, England

Continuation-in-part of Ser. No. 387,019, Jun. 10, 1982, Pat. No. 4,488,701. This application Aug. 15, 1984, Ser. No. 641,054

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.[4] G12B *9/00*

U.S. Cl. 248—27.1 **6 Claims**



1. A mounting structure coupling a hydraulic cylinder housing to a support plate, said housing having a generally cylindrical peripheral surface portion and a substantially circular flange at one side of said generally cylindrical peripheral surface portion, said mounting structure comprising at least a pair of symmetrically disposed radially projecting lugs at the other side of said generally cylindrical peripheral portion, a mounting opening in said support plate, said mounting opening having a cylindrical portion of a diameter conforming to said housing generally cylindrical portion extending from one face of said support plate to the other face of said support plate, and a cylindrical cut-out portion conforming to the perimeter of said lugs extending from said one face of said support plate to said other face, notched recesses of a perimeter conforming to the perimeter of said lugs extending from said other face of said support plate to a predetermined depth in said cylindrical portion of said mounting opening, each of said notched recesses being adapted to receive one of said lugs between two lateral abutment walls of said notched recesses, the first of said abutment walls extending to said other face of said support plate and the second of said abutment walls extending part of the way to said other face, whereby rotation of said housing in one direction after introduction of said lugs and cylindrical peripheral portion through said mounting opening is prevented by the first of said abutment walls extending all the way to the other face of said support plate and rotation of said housing in an opposite direction is enabled by passage of said lugs over the second of said abutment walls extending part of the way to said other face of said support plate, each first of said abutment walls preventing rotation of said lugs beyond said notched recesses, and spacer means disposed between said housing circular flange and said one face of said support plate for drawing each of said lugs within one of said notched recesses.

4,640,479

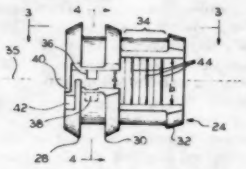
STRAIN RELIEF GROMMET

William W. Shely, St. Charles, and Peter M. Wells, Sycamore, both of Ill., assignors to All States Inc., Chicago, Ill.

Continuation of Ser. No. 462,312, Jan. 31, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,007

Int. Cl.[4] F16L *5/00*

U.S. Cl. 248—56 **10 Claims**



1. A plastic strain relief eyelet device for protecting, insulating, and holding a cord passing through a perforation in a chassis against abrasion and axial forces exerted by pulling upon said cord; said strain relief device comprising a cylindrical ring with a C-shaped cross section having a single longitudinal open split sector along one side and having a substantially uniform internal diameter throughout forming a grommet, a spaced parallel pair of annular shoulder means formed on an outside surface of said C-shaped cylindrical ring for securely mounting said grommet in a perforation on a chassis by being pushed therethrough, one of said shoulder means being at a first end of said grommet; means formed on the outside perimeter surface of said cylinder at a location adjacent the other of said pair of shoulder means for securely receiving, retaining and positioning a cable tie which wraps around the circumference of the split cylinder, said longitudinal open split sector being smaller in the area of said spaced parallel annular shoulders than in the area of the cable tie, the means for receiving, retaining and positioning said cable tie being at an end of said grommet which is opposite said first end, the length of said cylinder being equal to the combined widths of said pair of annular shoulder means, a width approximately equal to a thickness of said chassis, and a width approximately equal to a width of said cable tie; internal ridges formed on an inside wall of said cylinder for applying a clamping pressure transverse to said axial force by pressing against a cord passing through said grommet with sufficient force to deform a jacket on said cord; and means responsive to an attachment and selective tensioning of said cable tie about the outside perimeter for drawing together said split grommet to squeeze said internal ridges into said cord and to apply a selected predetermined tension in said strap and therefore a selected clamping pressure upon said cord as it is captured by said internal ridges.

4,640,480

DEVICE FOR SUPPORTING PIPES HAVING A LOW THICKNESS

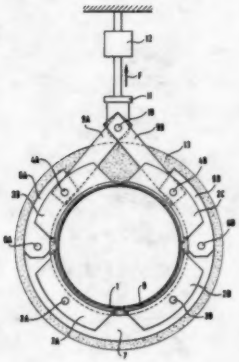
Jean-Claude Semedard, Paris; Jean-Jacques Marsault, St Arnould en Yvelines; Jean-Pierre Peyrelongue, Pontchartrain, and Gérard Vallée, Viroflay, all of France, assignors to Stein Industrie, Velizy Villacoublay, France

Filed Aug. 5, 1985, Ser. No. 762,246

Claims priority, application France, Aug. 8, 1984, 84 12539

Int. Cl.⁴ F16L *3/00*

U.S. Cl. 248—62 **7 Claims**



1. A device for supporting a pipe (1) of given radius of curvature which has a low thickness in relation to its diameter and which is subjected to considerable variations in temperature and to a radial traction stress of a known direction, said device comprising:

(a) a number of support cradles (2A, 2B, 2C, 2D) having an internal profile with a radius of curvature close to that of the pipe;

(b) a rigid half-collar (7) for mounting around a portion of the pipe and separated from the pipe periphery, certain of the cradles being mounted to said rigid half-collar for internal profile contact with the periphery of said pipe;

(c) two first arms (5A, 5B) articulated on the ends of the half-collar (7), other of said cradles being mounted to said arms for internal profile contact with the periphery of said pipe; and

(d) a connection device (9A, 9B, 10, 11) comprising two second arms (9A, 9B), said two second arms being articulated at one end on said first mentioned arms, respectively and at the other and commonly on a pivot pin (10), and means for exerting a radial traction stress to said second arms for tightening said cradles about the pipe under the force of radial traction (F) applied to the pin and independently of the expansion of the pipe.

4,640,481

CAMERA HOLDER

Teruo Kohno, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Kanagawa, Japan

Filed Sep. 17, 1984, Ser. No. 651,547

Claims priority, application Japan, Sep. 30, 1983, 58-150574[U]

Int. Cl.⁴ A47G *29/00*

U.S. Cl. 248—126 **13 Claims**

1. A camera holder having multiple functions, comprising:

first pipe provided with camera mount means at one end thereof;

a second pipe telescoped in said first pipe from the other end of the first pipe to be slidable along an axis of the first pite;

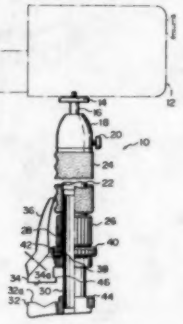
pipe fastening means for fastening said second pipe telescoped in the second pipe at a desired position;

a first clamp seat rigidly mounted on the second pipe;

a second clamp seat mounted on an outer periphery of the second pipe to be slidable along and rotatable about an axis of the second pipe, said second clamp seat being provided with a rotatable arm having locking means;

clamp fastening means for fastening the second clamp seat after positioning the second clamp seat relative to the second pipe;

breast support arm means constituted by the first and second clamp seats, the rotatable arm of the second clamp seat



and the clamp fastening means and operable in a breast support mode such that the rotatable arm is rotated and locked by the locking means in a predetermined angular position and the second clamp seat is moved to a predetermined fixing position on the second pipe and rotated until the second clamp seat becomes locked to the first clamp seat whereby the second clamp seat is fastened by the clamp fastening means at the predetermined fixing position; and

leg means for cooperating with said rotatable arm of the second clamp seat to constitute a tripod, said leg means being nested in the second pipe when out of use and pulled out from the second pipe when in use.

4,640,482

FOLDABLE TRIPOD

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 25, 1984, Ser. No. 653,901

Int. Cl.⁴ F16M *11/38*

U.S. Cl. 248—168 **16 Claims**

1. An apparatus for supporting an article, comprising:

an elongated support having a predetermined axis;

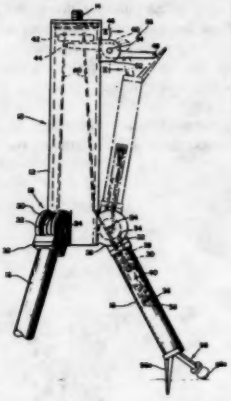
a plurality of legs;

bracket means including bearing means mounted on said support for mounting each of said legs for pivotal movement between support positions in which said legs extend angularly relative to said axis, and storage positions, and having an axis of rotation extending normal to said predetermined axis, said bracket means each being provided with an arcuate peripheral surface at least partially and eccentrically circumscribing said bearing means, and whereby the spacing between said peripheral surface and said axis of rotation increases radially from a minimum to a maximum;

abutment means connected with said legs in facing relationship to said peripheral surfaces and radially movable relative thereto for maintaining said legs in their support positions; and

means for selectively radially moving said abutment means into engagement with said peripheral surfaces for arrest-

ing each leg against pivotal movement in the direction of the radially increasing curvature and to provide quick



release of each leg for pivotal movement in the opposite direction.

4,640,483

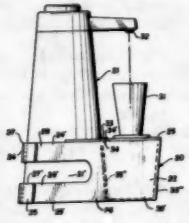
PLATFORM DEVICE

Jerold W. Tufte, Box 79, Glenfield, N. Dak. 58443

Filed Feb. 25, 1985, Ser. No. 704,790

Int. Cl.[4] A47K *1/08*

U.S. Cl. 248—311.2 **1 Claim**



1. A support platform device for attachment to a liquid dispenser of the pump type for dispensing fluid from its spout while upright, said platform device comprising a horizontal platform; a pair of straps having connecting means connecting their one ends to the platform and adapted to be extended about the dispenser with securing means at their outer ends to secure outer ends to one another and in fixed relation to the dispenser so as to secure the platform to the dispenser, so that the dispenser supports the platform; said platform serving to support a receptacle for receiving fluid, with said platform and receptacle being directly below the spout and spaced above the bottom of the dispenser so as to conveniently receive fluid pumped from the spout into the receptacle; said connecting means comprising a second receptacle mounted to said straps beneath the spout; said platform being operatively mounted to said second receptacle to also serve as a top.

4,640,484

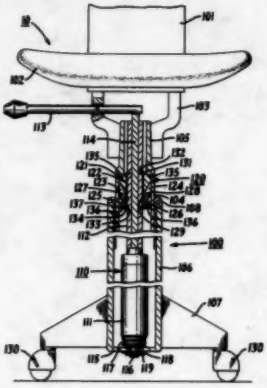
SUPPORT COLUMN WITH GRAVITY DEPENDENT RETENTION MEANS

Lee T. Lamond, North Wales, Pa., and Richard D. Staton, Collingswood, N.J., assignors to Fichtel & Sachs Industries, Colmar, Pa.

Filed May 6, 1985, Ser. No. 730,796

Int. Cl.[4] F16M *11/28*

U.S. Cl. 248—407 **13 Claims**



1. An adjustable-length support column comprising:

(a) a first tubular member for connecting to a surface to be supported;

(b) a second tubular member for connecting to a base for the surface, one of the tubular members being telescopically received within the other;

(c) pneumatic spring means located within the first and second tubular members comprising:

(1) a cylinder member,

(2) a piston rod member axially movable within the cylinder member and having a first annular groove in an outwardly extending portion thereof, and

(3) means for permitting adjustment of the axial position of the piston rod member relative to the cylinder member and thereby of the length of the support column;

(d) means for operatively coupling the piston rod member to the first tubular member in load-transmitting relationship thereto;

(e) means for operatively coupling the cylinder member to the second tubular member in load-transmitting relationship thereto; and

(f) means for releasably locking the piston rod member within the first tubular member comprising:

(1) a lock body retained within the first tubular member and having a bore with the piston rod member slidably disposed therein, the lock body having one or more cavities inclined downwardly and communicating with the bore,

(2) a locking member slideably disposed within each cavity, such that, when the column is upright and the inner ends of the cavities are adjacent the first annular groove, each locking member falls to a first position in which a portion of the locking member protrudes into the bore and, when the column is inverted, each locking member falls to a second position in which the locking member is retracted from the bore, and

(3) the first annular groove in the piston rod member cooperating with the portion of each locking member that protrudes into the bore of the lock body to achieve locking of the piston rod member to the lock body when the column is upright.

4,640,485

ADJUSTABLE SUPPORT FOR DISPLAY MONITOR

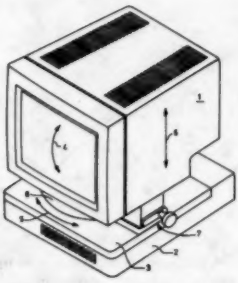
George D. Day, Winchester; John K. Flack, Chandlers Ford; Ian Golledge, Romsey; Christopher J. Hillary, Chandlers Ford; John V. Pike, and Michael H. Watson, both of Winchester, all of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1985, Ser. No. 742,260

Claims priority, application European Pat. Off., Jun. 8, 1984, 084303888

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—422 8 Claims



1. An adjustable support for a display monitor comprising a turntable, a spaced pair of vertically-extending support columns carried by said turntable, at least one of which columns is hollow to contain a gas strut of non-magnetic material, a support beam supported on said columns to extend horizontally therebetween and slidable along said columns thereby to vary the height of the support beam relative to the turntable, a support carrier mounted on said support beam between said columns in such a manner that the angle between the carrier and the beam can be varied, and means for securing a display monitor to the support carrier, the gas strut being secured by one end of the turntable and its other end to the support beam to counterbalance the weight of a display monitor secured on the carrier thereby to assist in the raising and lowering of the support beam along the support columns, in which each support column comprises a rack, a pair of pinions mounted on the support beam to co-operate with the racks being coupled together by means of a shaft to distribute the force exerted by the gas strut between the support columns.

4,640,486

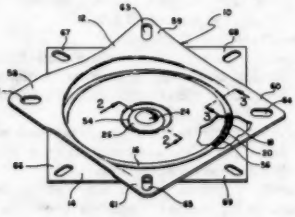
SEAT SWIVEL APPARATUS

Donald G. Neville, Manhattan Beach, Calif., assignor to International Glide Mfg. Corp., Glendale, Calif.

Filed Jun. 14, 1985, Ser. No. 744,934

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—425 16 Claims



1. A seat swivel apparatus comprising:

a first mounting plate having circular recess formed therein adapted to connect to a seating surface, said first mounting plate having a bore defined therein;

a second mounting plate having a circular recess formed therein adapted to connect to a support structure, said second mounting plate having a bore defined therein;

bearing means located within said recesses for transmitting loads between said first and second mounting plates and for allowing relative rotation between said plates; and

means for rotatably fastening said plates, said fastening means being insertable into each of said bores on said first and second mounting plates,

said fastening means having a Belleville spring attached thereto for biasing said mounting plates together, said Belleville spring maintaining a continuous and generally constant force to urge said mounting plates together.

4,640,487

PIPE SUPPORTS

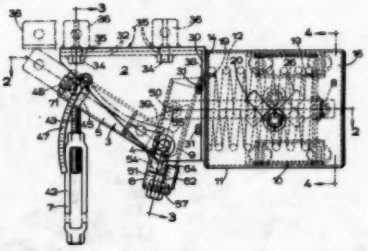
Anthony J. Salter, Cherry Trees, The Ridgeway, Sedgley, Dudley, West Midlands, DY3 1BS, England

Filed Apr. 16, 1985, Ser. No. 723,740

Claims priority, application United Kingdom, Apr. 17, 1984, 8410006; Apr. 17, 1984, 8410007

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—571 15 Claims



1. A pipe support of the constant tension kind which comprises a carrier, a pivot on said carrier and a lever which is pivotally mounted on said carrier by said pivot, load attachment means on said lever adapted to connect a pipe to be supported to said lever at a position thereon spaced from said pivot, a connecting link connected to said lever, spring means which acts on said lever through said connecting link such that a spring force is exerted on said lever which produces a moment about said pivot, said spring means being slidably connected to said carrier for adjusting the position of said spring means relative to said carrier such as to alter the moment of spring force about said pivot by varying the perpendicular distance from the pivotal axis of said lever to a central longitudinal axis of said connecting link, and screw retention means adjustably connecting said spring means to said carrier and acting between said spring means and said carrier to secure said spring means and said carrier against relative sliding movement in any adjusted position of said spring means.

4,640,488

SEAT SUSPENSION

Takao Sakamoto, Akishimashi, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Jan. 4, 1985, Ser. No. 688,980

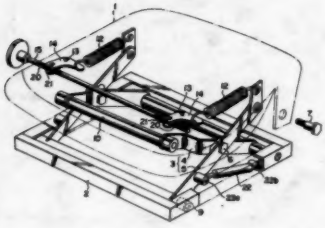
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—588 5 Claims

1. In a seat suspension comprising an upper frame, a lower frame, a pair of X-shaped links disposed between said upper frame and said lower frame such that one of the links is dis-

posed at the left side of said upper and lower frame while the other of the links is disposed at the right side of said upper and lower frames, each of said pair of X-shaped links being made up of (a) a first link component having a forward upper end portion at the upward positioned end thereof and a rearward lower end portion at the downward positioned end thereof and (b) a second link component having a forward lower end portion at the downward positioned end thereof and a rearward upper end portion at the upward position thereof, the arrangement of said first and second link components being such that the first link component is rotatably, pivotally fixed to the second link component at the center portion of each thereby allowing the first and second link components to be freely rotated independently of each other, each of said pair of X-shaped links being connected to said upper frame such that one of said forward upper end portion of said first link component and said rearward upper end portion of said second link component is rotatably fixed to said upper frame while the other of said forward upper end portion of said first link component and said rearward upper end portion of said second link component is slidably supported by said upper frame; and each of said pair of X-shaped links being connected to said lower frame such that one of said forward lower end portions of said



second link component and said rearward lower end portions of said first link component is rotatably fixed to said lower frame while the other of said forward lower end portions of said second link component and said rearward lower end portions of said first link component is slidably supported by said lower frame, and a pair of tension springs disposed above, and adjacent to, said pair of X-shaped links, the improvement comprising:

(a) a pair of bell cranks rotatably, pivotally supported at substantially the center portion thereof;

(b) rotatable means for operating said pair of bell cranks;

(c) a pair of shock absorbers, the arrangement of said pair of shock absorbers being such that one of the shock absorbers is disposed at one lateral side of said pair of X-shaped links while the other of the shock absorbers is disposed at the other lateral side of said pair of X-shaped links, and further, that one end of each shock absorber is rotatably connected to said pair of X-shaped links, respectively; and

wherein said pair of tension springs are each connected at one end thereof to one of said forward upper end portions of said first link component and said rearward upper end portion of said second link component and connected at the other end thereof to one end portion of each of said pair of bell cranks.

4,640,489

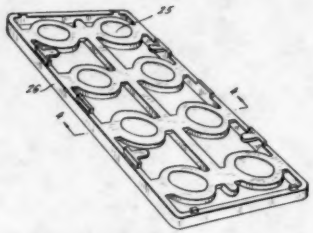
MOLD FOR MAKING CONTACT LENSES, EITHER THE MALE OR FEMALE MOLD SECTIONS BEING RELATIVELY MORE FLEXIBLE

Hans-Ole Larsen, Farum, Denmark, assignor to Mia-Lens Production A/S, Copenhagen, Denmark

Division of Ser. No. 549,702, Nov. 7, 1983, Pat. No. 4,565,348, which is a continuation-in-part of Ser. No. 360,107, Mar. 19, 1982, Pat. No. 4,495,313. This application Sep. 19, 1985, Ser. No. 777,667

Int. Cl.[4] B29C *39/40, 33/40, 39/26*

U.S. Cl. 249—122 **10 Claims**



1. A lens mold assembly comprising a plurality of female mold sections having a concave optical surface terminating in a peripherally extending annular flange, the surface of said flange forming a sharp edge at the intersection with said concave optical surface;

a plurality of male mold sections having a substantially spherical convex optical surface terminating in a peripherally extending annular flange;

the maximum outside diameter of the convex surface of said male mold section being greater than the maximum inside diameter of the concave surface of said female mold section whereby said sharp edge of said female mold section impinges on said convex surface of said male mold section to form a mold cavity in said mold assembly with the facing surfaces of said peripherally extending annular flanges of said female and male mold sections being spaced apart;

one of said female or male mold sections having relatively greater flexibility than the other section whereby compensation for shrinkage during polymerization of monomers within the mold cavity is afforded by said relatively more flexible mold section; and each of said female mold sections being attached to a supporting frame by a tab or bar extending between said female mold sections and said supporting frame, and each of said male mold sections being individually centered on a respective female mold section to define said mold cavity.

4,640,490

SPACER WASHER FOR CONCRETE FORM TIE RODS

T. Woodrow Wilson, 16th & Mica Rd., Box 1, Spokane, Wash. 99206

Filed Mar. 18, 1986, Ser. No. 840,687

Int. Cl.[4] E04G *17/06*

U.S. Cl. 249—214 **4 Claims**

1. A compound spacer washer for concrete form tie rods having a cylindrical body with at least one flattened portion for each washer to be carried thereby, comprising, in combination:

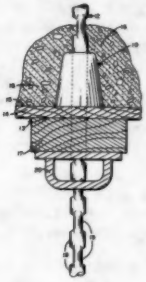
an elongate washer body, having planar base and axially inwardly tapering sides extending therefrom to communicate with a flattened nose portion,

said washer body defining a medial tie rod channel extending axially therethrough to slidably receive a tie rod to be serviced, and

a fastening member chamber larger than the medial tie rod channel in the nose portion thereof, said chamber having

screw thread means defined on the internal wall of the chamber to threadedly receive a fastening member; and

a cylindrical fastening member having means on a peripheral surface thereof for threadedly engaging said screw thread means within the fastening member chamber, a periphery configured to threadedly engage within the fastening



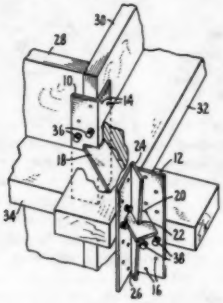
member channel defined in the washer body, and defining a tie rod slot, extending from the periphery through the center of the fastening member and therebeyond, configured to be positionable upon the flat portion of the tie rod to be serviced but not movable axially therealong past the flat portion on which it is positioned.

4,640,491

WALER CORNER LOCK ASSEMBLY

Warren W. Grist, and David L. Kelly, both of Sacramento, Calif., assignors to The Burke Company, San Mateo, Calif.

Filed Jun. 21, 1985, Ser. No. 747,322
Int. Cl.[4] E04G *17/02*
U.S. Cl. 249—219 W **11 Claims**



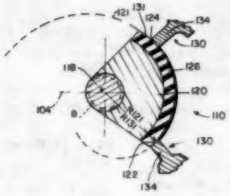
1. An assembly for securing a pair of walers in crossed relationship, said assembly comprising: a first member having converging outwardly facing surfaces complementally engageable with the crossed walers to one side thereof, said outwardly facing surfaces of said first member defining a first angle therebetween; a bar secured to said first member and extending outwardly from the outwardly facing surfaces thereof; a second member received on said bar and having inwardly facing converging surfaces defining a second angle therebetween, said inwardly facing surfaces of the second member being complementally engageable with the crossed walers to the side thereof opposite said one side and said second member being movable relative to said bar to bring the outwardly facing surfaces of the first and second members into simultaneous engagement with opposite sides of the crossed walers, said first and second angles being essentially equal; and means to secure said second member to said bar to maintain the first and second members in such engagement.

4,640,492

INVOLUTE VALVE CLOSURE

William L. Carlson, Jr., St. Cloud, Minn., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 23, 1985, Ser. No. 694,097
Int. Cl.[4] F16K *25/00, 5/00*
U.S. Cl. 251—163 **19 Claims**



1. Rotary valve means for controlling fluid flow therethrough, comprising:

valve housing means having fluid passageway therethrough;

valve closure member movably supported in said valve housing means about a pivotal axis and having a shaped sealing surface; and

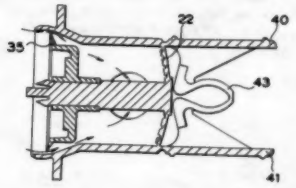
valve seat surface means within said valve housing means for engagement with said shaped sealing surface of said valve closure member to restrict fluid flow through said fluid passageway means, said valve seat surface means having, with respect to a plane perpendicular to said pivotal axis, an arc segment forming a sufficient portion of an involute so as to not form a portion of an eccentrically mounted circle such that the sealing portions of said shaped sealing surface and said valve seat surface means engage substantially simultaneously upon closure of said rotary valve means.

4,640,493

TAP FOR A LIQUID CONTAINER

Henryk Dudzik, Mansfield, United Kingdom, assignor to Mardon Illingworth, Ltd., England

Filed Jun. 24, 1985, Ser. No. 747,978
Int. Cl.[4] B67D *3/00*
U.S. Cl. 251—342 **9 Claims**



1. A tap for a container holding a substance, wherein said tap comprises:

hollow body means having an open mouth defined at an end thereof;

flexible diaphragm means closing an end of said hollow body means opposite to said open mouth;

outlet port means for providing an exit way from said tap for said substance;

valve closure means in operative engagement with said diaphragm means for opening and closing a passageway between said open mouth and said outlet port means;

spaced grippable element means including a pair of grippable levers hinged to said hollow body means said grippable levers extending generally parallel to the axis of said hollow body means;

resilient means interposed between and biasing said grippable levers in a manner whereby said tap is maintained in a closed position whereupon the actuation of said grippable levers against said baising by said resilient means thereby causes said resilient means to act on said diaphragm means which in turn acts upon said valve closure means to open said tap.

4,640,494

TAP OR VALVE

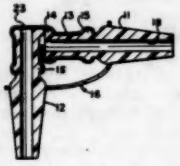
Peter L. Steer, Surrey, England, assignor to Craig Medical Products, Limited, Sussex, England

Filed Jun. 21, 1985, Ser. No. 747,203

Claims priority, application United Kingdom, Jul. 6, 1984, 8417347

Int. Cl.[4] F16K *31/00*

U.S. Cl. 251—354 **6 Claims**



1. A tap comprising a first tube, a second tube and a sleeve of flexible elastic material placed over abutting or nearly abutting ends of the tubes to form a flexible elastic coupling between said tubes to allow fluid passage between said tubes when said tubes are substantially coaxially aligned and to allow displacement of one of said tubes substantially at right angles to the other by stretching said sleeve across an open end of one of said tubes to close said fluid passage, the facing ends of the tubes each comprising at least one flange so that when the tubes are displaced to the closed position at substantially right angles to one another, the flanges engage to help to maintain the displaced tubes in the closed position.

4,640,495

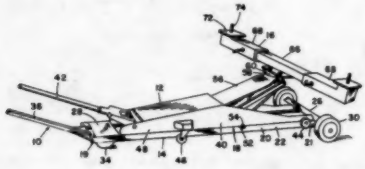
DEVICE FOR MOVING AN AUTOMOBILE WITH DISABLED WHEELS

David M. Parsons, Box 14, Antigo, Wis. 54409

Filed Jan. 24, 1985, Ser. No. 694,354

Int. Cl.[4] B66F *3/00*; B60P *1/48*

U.S. Cl. 254—8 B **12 Claims**



1. A moving device for moving automobiles with disabled wheels and having an automobile frames, the moving device to be used in conjunction with a conventional floor jack having a floor jack body, rear jack wheels projecting sidewardly therefrom, and a jack arm with a distal end so that it may be raised and lowered, the moving device comprising:

(a) a jack dolly including wheels upon which the jack dolly can be moved, a securing means for securing the floor jack on the jack dolly, and a longitudinally extended box having a front end, a rear end, and opposed side pieces wherein the securing means includes opposed side members forming part of the side pieces and extending upwardly, the side members being spaced apart from each other by a distance selected to be such that the floor jack snugly fits therebetween and side-to-side movement of the floor jack within the box is constrained, the side members including rear jack notches adapted to snugly engage the rear jack wheels so that movement of the floor jack toward the front and rear ends of the box is restrained; and

(b) cradle having retaining means for retaining the cradle on the distal end of the jack arm in pivoting relation thereto, and engaging means for engaging the cradle with the automobile frame so that the cradle may be engaged with the automobile frame at a selected location thereon and the jack arm of the floor jack may be raised to lift the disabled wheels so that the automobile may be moved by moving the jack dolly on its wheels.

4,640,496

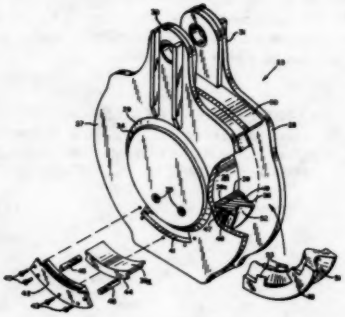
DUMP BLOCK FOR DRAGLINE BUCKET

Robert L. Van Hoomissen; Terry L. Briscoe, and Don P. S. Barker, all of Portland, Oreg., assignors to ESCO Corporation, Portland, Oreg.

Filed Apr. 4, 1985, Ser. No. 720,301

Int. Cl.[4] B66D *3/04*

U.S. Cl. 254—415 **21 Claims**



1. A dump block for a dragline bucket comprising a body having a central cylinder and auxiliary-spaced rope confining walls defining a reeveway for a dump rope, a ring rotatably mounted on said cylinder and having a replaceable plastic outer surface adapted to engage said rope and a replaceable plastic inner surface arranged to engage said cylinder, said cylinder being equipped with means for lubricating said ring inner surface, said inner and outer surfaces each including a plurality of arcuately related, removable plastic segments, at least one of said walls being equipped with access means for inner surface segment removal.

4,640,497

FILTRATION APPARATUS

Mark L. Heamon, Hendersonville, N.C., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

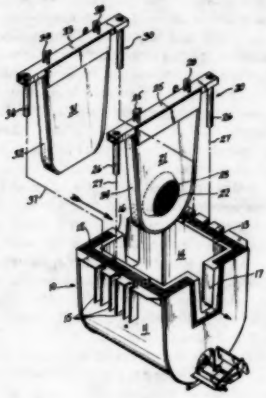
Filed Oct. 25, 1985, Ser. No. 791,604

Int. Cl.[4] C22B *21/06*

U.S. Cl. 266—227 **14 Claims**

1. An improved molten metal filtration apparatus comprising a filter chamber having an internal surface for contact with molten metal, an external surface out of contact with molten metal, a molten metal inlet and a molten metal outlet defining a molten metal flow path therebetween, a removable filtration assembly engageable with said filter chamber and disposed between said inlet and outlet including a solid, plate-like member resistant to said molten metal completely blocking said flow path, a porous filter member seated in said solid member permitting flow of molten metal therethrough so that molten

metal flowing through the filter chamber will flow through the porous filter member and means on said external surface for



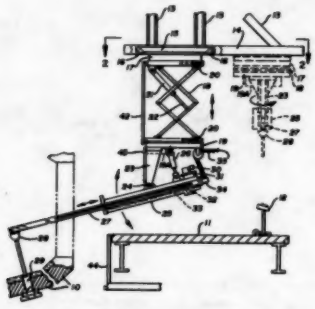
engaging and disengaging said filtration assembly from the filter chamber.

4,640,498

HORIZONTALLY AND VERTICALLY MOVABLE ELEVATED APPARATUS FOR PLACING SLAG RETAINING MEANS IN TAPPING CONVERTERS

Micheal D. LaBate, Ellwood City, and Joseph Perri, Coraopolis, both of Pa., assignors to Insul Company, Inc., East Palestine, Ohio

Filed May 14, 1985, Ser. No. 733,911
Int. Cl.[4] C21C *5/46*
U.S. Cl. 266—272 **8 Claims**



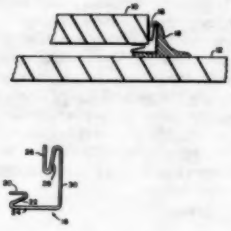
1. Apparatus for placing a slag retaining device in a tap hole in a tapping converter adjacent a charging floor, said apparatus comprising a horizontally disposed railway suspended from overhead supports substantially above said charging floor, a drive tube and an elongated insertion beam movable carried thereby, a carriage on said overhead railway and a vertically movable device depending from said carriage, a rotatable table on said vertically movable device, said drive tube pivotally mounted to said rotatable table, first means for moving said carriage on said railway; second means for moving said vertically movable device and third means for moving said elongated insertion beam relative to said drive tube, jaws on one end of said elongated insertion beam for detachably holding said slag retaining device whereby said drive tube and said elongated insertion beam may be moved vertically and horizontally and rotated with respect to said charging floor adjacent said tapping converter.

4,640,499

HERMETIC CHIP CARRIER COMPLIANT SOLDERING PADS

Paul F. Hemler, Arnold, Md., and William A. Rohr, Buffalo, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 1, 1985, Ser. No. 729,389
Int. Cl.[4] F16F *1/00*
U.S. Cl. 267—160 **4 Claims**



1. A compliant soldering pad for attaching an electronic device to electrical paths, said compliant soldering pad comprising:

a horizontal leg, said horizontal leg being for soldering to electrical paths,

a vertical leg, said vertial leg being integrally attached to said horizontal leg at an angle of about 90 degrees,

a lower diagonal leg, said lower diagonal leg being attached to said horizontal leg,

an upper diagonal leg, said upper diagonal leg being attached to said vertical leg, said diagonal legs being near the hypotenuse between said horizontal leg and said vertical leg,

a vertical support, said vertical support being attached to said lower diagonal leg, said vertical support being for soldering to a bottom of an electronic device, and

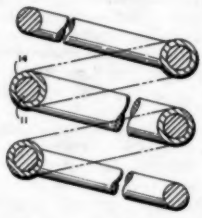
a horizontal support, said horizontal support being attached to said upper diagonal leg, said horizontal support being for soldering to a vertical side of an electronic device.

4,640,500

INHERENTLY EFFECTIVELY DAMPED COILED SPRING

Jgi J. Shiau, 3010 Persimmon Place, Fullerton, Calif. 92635

Filed Oct. 31, 1985, Ser. No. 793,250
Int. Cl.[4] F16F *3/02*
U.S. Cl. 267—168 **13 Claims**



1. An improved inherently effectively damped coiled spring construction, comprising:

(a) a first coiled spring having a pair of ends and a plurality

of coils, the two ends of which are adapted to operably bear a load;

(b) a second coiled spring having essentially the same coil diameter as the first spring and further having a pair of ends and a plurality of coils, said second coiled spring being in the form of at least one tubular spring, the coils of the tubular spring being concentrically disposed about each of the coils of the body of the coils of the first coiled spring in operable intimate frictional engagement therewith, the second coiled spring being shorter in length than the body of the first coiled spring so that the ends of the second coiled spring are not contiguous with the ends of the first coiled spring and are free of contact with the load imposed on the ends of the first springs so that when the first spring is dynamically compressed or expanded, relative twisting movement between the coils of the springs does not occur, but only occurs immediately following the yielding of the static frictional engagement which exists along essentially the entire faying surface between the two springs, whereby the second spring disengages from further twisting movement of the temporarily deformed coils of the first spring, thereby creating an effective friction generating and energy dissipating device and damping the relative axial movement of the combination formed by the first and second springs.

4,640,501

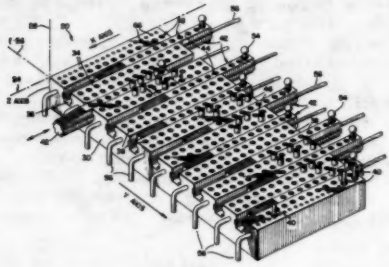
HOLDING FIXTURE

David A. Poland, Hawthorne, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Apr. 29, 1985, Ser. No. 728,430

Int. Cl.[4] B25B *11/00*

U.S. Cl. 269—21 **8 Claims**



1. A holding fixture capable of positioning an irregularly shaped article in a cartesian coordinate system and for holding the article immobile to enable machining operations to be accurately and repeatedly performed on successive articles comprising:

a base member being hollow to define a chamber therein and having a first working surface and a plurality of spaced apart, recessed, ways extending parallel to an x-axis of the coordinate system, said base member having a plurality of first bores extending between said working surface and the chamber and including first stop means fixed on said base member engageable by the article for defining a position of the article along a y-axis of the coordinate system;

a plurality of positioning members, each being slidably received in said ways and movable between a rest position and active positions, each of said positioning members being hollow to define a cavity therein and having a second working surface generally coplanar with said first working surface of said base member and a plurality of second bores extending between said second working surface and the cavity;

a plurality of vacuum hold down members slidably received within said first and second bores, said hold down members being tubular and terminating at an outer rim, each of said hold down members being movable in a direction parallel to the z-axis of the coordinate system between a retracted position with said outer rim being generally flush with said first and second working surfaces and an extended position spaced from said first and second bores and said working first and second surfaces, said outer rims of a predetermined pluality of said hold down members adapted to supportingly engage the article thereon for defining the position of the article in the z-direction at a plurality of spaced locations parallel to the z- and y- axes of the coordinate system;

second stop means mounted on each of said positioning members, movement of each of said second stop means being interrupted by engagement with the article when said associated positioning member is slid along said way toward the article supportingly engaged on said hold down members, said plurality of said second stop members thereby defining the position of the article in the x-direction at a plurality of spaced locations in the y-direction of the coordinate system; and

a source of vacuum to the chamber and to the cavity;

said hold down members being connected with the vacuum when said hold down members are in said extended position to thereby hold immobile the article supportingly engaged thereon, said hold down members being disconnected from the vacuum when said hold down members are in said retracted positions.

4,640,502

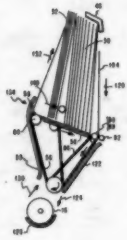
ENVELOPE HOPPER FOR FEED AND DELIVERY

Adolph B. Habich, Austin, and Ronald E. Hunt, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 629,933, Jul. 11, 1984, abandoned, which is a continuation of Ser. No. 335,438, Dec. 29, 1981, abandoned. This application Oct. 28, 1985, Ser. No. 792,635

Int. Cl.[4] B65H *3/06, 5/02, 1/28*

U.S. Cl. 271—4 **5 Claims**



1. Apparatus for feeding documents seriatim from a stack of such documents maintained on edge through a transport path to, around and from a print station located along a rotatably driven platen in a printer comprising:

divided storage means having an input and output hopper located upstream of the platen for holding separately fresh and printed documents;

a picker station adjacent said divided storage having a picker roller, a feed roller and a backup roller, wherein said backup roller and said feed roller form a feed nip, and wherein said picker roller is coaxial to said feed roller, said picker roller located at one side, its axis parallel to the axis of the platen, of the storage means drivingly connected to the platen and having a protruding edge for engaging the bottom edge of a fresh document to be fed and urging it away from the stack and into the transport path, said picker roller having a larger diameter than said feed roller to allow said document to enter the feed nip;

an output throat area having an endless belt, fixed guide means, and resilient means for urging the bottom edge of said printed document to contact relation with said endless moving belt for transporting said document away from said output throat area and into said output hopper;

said transport path being generally triangular in shape and defined by endless belt means continuously moving through said divided storage means, picker station, print station, and output throat;

said continuously moving belt means being provided for simultaneously urging the stack of fresh document toward said picker roller means, urging a picked document around said platen to said output throat, and the printed documents away from the entry area to said printed document storage section of said divided storage means.

4,640,503

SHEET-SEPARATING AND CONVEYING SUCTION DEVICE

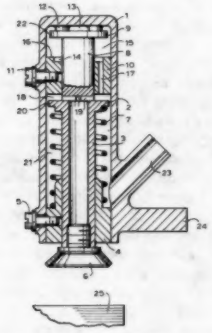
Reinhard Naumann, Delitzsch, German Democratic Rep., assignor to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jan. 30, 1985, Ser. No. 697,118

Claims priority, application German Democratic Rep., May 28, 1984, 2634154

Int. Cl.[4] B65H *3/08*

U.S. Cl. 271—103 **5 Claims**



1. A sheet-separating and conveying suction device, comprising a housing; a first sleeve positioned within said housing and secured thereto; a first suction piston having a hollow piston rod carrying a suction nozzle and being reciprocally movable upwardly and downwardly in said first sleeve between an initial and end position; a spring biasing said piston to the initial position in said housing, in which said suction nozzle is remote from a sheet to be sucked from a stack, said housing having a peripheral wall and an end wall, said first suction piston with said hollow piston rod and said peripheral wall and said first sleeve defining one cylinder chamber in said housing while said peripheral wall and said end wall defining another cylinder chamber in said housing; throttle means for connecting said one cylinder chamber and said another cylinder chamber with each other; and braking means for retarding the movement of said first suction piston towards its initial position, said braking means including an additional suction piston having a piston rod and cooperating with said first suction piston and an additional sleeve positioned in said housing and secured thereto, said additional suction piston being slidably movable in said additional sleeve between said end wall and said first suction piston, the piston rod of said additional piston and said additional sleeve defining a first intermediate cylinder chamber while the piston rod of said additional piston and said peripheral wall defining a second intermediate cylinder chamber, said throttle means connecting said first intermediate cylinder chamber with said another cylinder chamber and said second intermediate cylinder chamber, the piston rod of said first suction piston having a bore which opens into said second intermediate cylinder chamber.

4,640,504

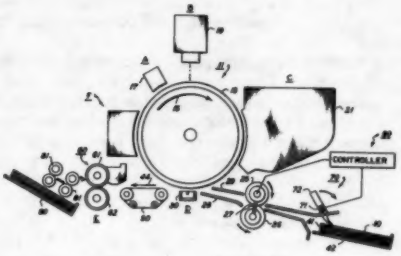
PADDLE WHEEL FEEDER

Gerald M. Garavuso, Macedon, N.Y.; Shwu-Jian Liang, Spring Valley, Ohio, and Raghulinga R. Thettu, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1984, Ser. No. 627,269

Int. Cl.[4] B65H *3/32*

U.S. Cl. 271—113 **22 Claims**



1. A paddle wheel feeder adapted to feed sheets individually from a stack of sheets including a paddle wheel having a plurality of individual blades adapted to strike the stack one at a time to inertially separate the top sheet in the stack from the rest of the stack, characterized in that said each of said plurality of blades are semi-circular in shape with respect to an axis running orthogonal to the axis of rotation of said paddle wheel.

4,640,505

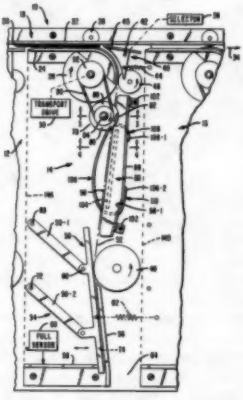
DOCUMENT GUIDE MECHANISM

Dale L. Placke, and Donald L. Weeks, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 25, 1985, Ser. No. 791,492

Int. Cl.[4] B65H *31/26*

U.S. Cl. 271—209 **7 Claims**



1. A document guide mechanism comprising:

an upstream end, a downstream end, and a feeding line positioned therebetween;

a receiving means located at said downsteam end for receiv-

ing documents to be pocketed; said documents which are pocketed in said receiving means having trailing edges which at times fan out towards said feeding line;

feeding means located at said upstream end for feeding said documents sequentially along said feeding line;

cupping means positioned between said feeding means and said receiving means for stiffening a document passing therethrough by forming concave and convex sides on said document; said cupping means including a cupping rib which is positioned along one side of said feeding line where said concave side is formed by said cupping means; and

a flexible band having a portion which extends from said one side of said feeding line across said feeding line so as to be engaged by the leading edge of a document being fed by said feeding means;

said flexible band having operating parameters to enable said flexible band to form a wave which progresses from said cupping means towards said receiving means as said leading edge of a document being fed progresses from said cupping means towards said receiving means to thereby move the trailing edges of said documents in said receiving means away from said feeding line to provide an entrance for the leading edge of said document being fed into said receiving means;

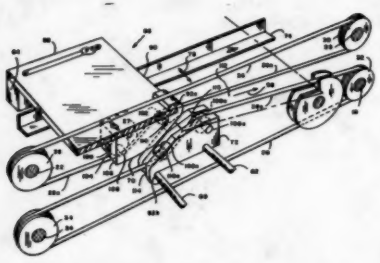
said cupping means including a pair of spaced driving rollers with said cupping rib being positioned between said pair of spaced driving rollers, said cupping rib also including a back-up rib which is positioned parallel to and spaced from said feeding line to provide a back up for said portion of said flexible band.

4,640,506

REVERSE COLLATING MACHINE

Harry E. Luperti, Wilton; Robert Irvine, Riverside, and Anthony Luvara, Stamford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 28, 1985, Ser. No. 791,889
Int. Cl.[4] B65H *31/36*
U.S. Cl. 271—212 **5 Claims**



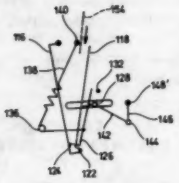
1. In a collating machine for stacking sheets of paper being fed seriatim thereto from a singulating feeder in the same order as said sheets appear in said singulating feeder, said collating machine having at least one upper, endless, elastic belt and one lower, endless, elastic belt, each of said belts having an upper and a lower reach, and wherein the lower reach of the upper belt is situated slightly above the upper reach of the lower belt to thereby frictionally engage and transport said sheets of paper, ramp means for lifting a succeeding sheet of paper over and onto a preceding, stopped sheet of paper, said ramp means including a slot for receiving the lower reach of said lower belt, and means for stopping each sheet of paper after said sheet has been lifted by said ramp means, the improvement comprising removable means for stacking said sheets of paper in the reverse order as said sheets appear in said singulating feeder.

4,640,507

DEVICE FOR FEEDING AND POSITIONING RECORDING MEDIUM

Makoto Ohgoda, and Kaoru Tamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1985, Ser. No. 704,686
Claims priority, application Japan, Feb. 22, 1984, 59-31736
Int. Cl.[4] G03C *5/16*
U.S. Cl. 271—245 **13 Claims**



1. A device for feeding and positioning a recording medium, comprising:

(a) a grip member for gripping, feeding, and positioning the recording medium therein, said grip member comprising a first plate and a second plate, each plate having upper and lower ends, means for mounting said second plate in confronting relation to said first plate with a gap between the lower ends of said plates and for permitting relative movement of at least the upper end of said second plate with respect to the upper end of said first plate to allow the recording medium to enter between said plates, and a cover member moveably mounted adjacent the lower ends of said plate for closing and opening said gap between lower ends of said first and second plates; and

(b) positioning means for holding said grip member with the upper ends of said plates opened in a recording medium receiving position, means for displacing said grip member after it has received the recording medium and closing the upper end portion thereof to thereby position said grip member to position the recording meduim in an exposure position in said grip member and for further displacing said grip member after the recording medium has been exposed from said exposure position and for opening said cover member for discharging the exposed recording medium out of said grip member through said gap.

4,640,508

PRECESSIONAL EXERCISING DEVICE

James C. Escher, Swarthmore, Pa., assignor to Gyro-Flex Corporation, Del.

Continuation-in-part of Ser. No. 477,175, Mar. 21, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,257
Int. Cl.[4] A63B *21/22*
U.S. Cl. 272—128 **16 Claims**

1. A device for exercising the muscles associated with a limb extremity or other part of the body by resisting precession torque generated by the device, comprising:

a support;

an intermediate supporting structure comprising an intermediate supporting member mounted on said support for rotation about at least one axis;

a housing;

bearing means within the housing;

a mass within the housing and supported by said bearing means for rotation about a spin axis, said mass being dynamically balanced about said spin axis;

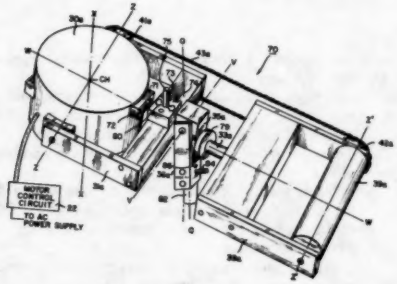
means for rotating said mass about the spin axis;

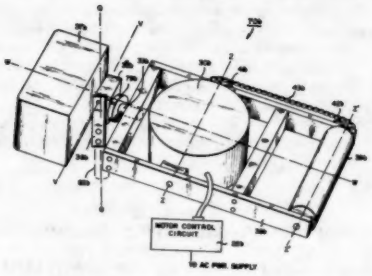
connecting means for connecting said housing to said intermediate supporting structure and for rotatably supporting said housing such that said housing is rotatable relative to said intermediate supporting member only about a first axis and a second axis, said first axis passing through the

centroid of mass of said housing and perpendicular to said spin axis, said second axis passing through the centroid of mass of said housing and perpendicular to both said spin axis and said first axis;

actuator means adapted to be held by or connected to said limb extremity or other part of the body, said actuator means being mounted on said intermediate supporting structure for rotation about two mutually orthogonal axes, one of said orthogonal axes being spaced apart from said first axis;

coupling means operatively associated with said intermediate supporting structure for bidirectionally linking said actuator means to said housing, so that (i) angular rotation of said actuator means about two mutually orthogonal axes results in corresponding angular rotation of said housing about said first and second axes respectively, and (ii) any precessional torque generated by said mass about said first and second axes is coupled to said actuator means





so as to apply corresponding amounts of torque to said actuator means about respective ones of said mutually orthogonal axes; and

counterbalance means connected to said intermediate supporting structure and coupled to said second axis for balancing said device about said at least one axis so that no force is required to maintain the actuator means in position when said limb extremity or other part of the body is not imparting any force to said actuator means;

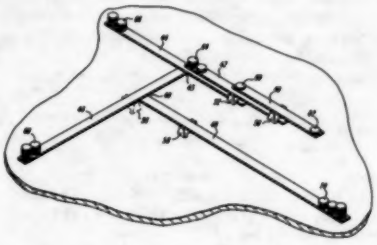
whereby the limb extremity or other part of the body may be exercised by rotating the actuator means about said mutually orthogonal axes and resisting the resulting torque applied to said actuator means about said mutually orthogonal axes via said coupling means due to the generation of precessional torque by said mass, said counterbalance means substantially compensating for the effect of gravity, so that the arm is subjected to substantially only torsional forces by said device.

4,640,509

BALANCE GAME

Edward L. Manspeaker, 483 Exton Lake Rd., Apollo, Pa. 15613-9214

Filed May 8, 1985, Ser. No. 731,917
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 GF **16 Claims**



4. A skill game, comprising:

a plurality of boards, each of said plurality of boards having two generally parallel planar surfaces, each of said planar surfaces having a length and a width; and

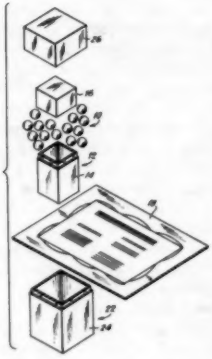
a plurality of fulcrums, each of said fulcrums having a base portion and a support portion, said support portion providing two generally parallel edges disposed a preselected distance apart to receive one of said plurality of boards in support relation when said board is disposed on top of said support portion, said base portion being shaped to receive a portion of one of said plurality of boards under said base portion, said base portion being provided with a groove disposed between two support legs, said groove being shaped to receive said portion of said board in clearance relation.

4,640,510

NON-COMPETITIVE GAME FOR TWO OR MORE PLAYERS

John C. Braddock, and Kathy M. Braddock, both of 1230 Park Ave., New York, N.Y. 10028

Filed May 30, 1984, Ser. No. 615,311
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 R **17 Claims**



1. A method of playing a game comprising the steps of:

assembling a plurality of tokens,

assigning a quantitative time value to each of said tokens,

preparing a certificate attesting to ownership of said tokens for purposes of the game,

transferring said tokens and certificate from a first player to a second player, thereby placing said second player in a position to use said tokens to place demands on the time of said first player,

selectively retransferring at least one of said tokens back to said first player with a concomitant demand by said second player on the time of said first player, said demand being in accordance with the quantitative time value assigned to said one token, and

passing an interval of time in accordance with said demand.

4,640,511

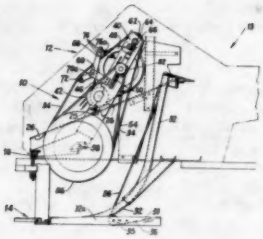
BOWLING BALL RETURN MECHANISM

Daniel R. Speranza, Westerville, Ohio, assignor to AMF Incorporated, White Plains, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,114

Int. Cl.[4] A63D *5/02*

U.S. Cl. 273—49 **6 Claims**



1. Bowling ball return apparatus adapted for mounting within the housing of a ball storage tray which is located at the bowler end of a bowling lane and adapted to receive a bowling ball returned on a ball return track from the pin deck end of the lane and to lift the ball upwardly onto the storage tray for pick up by a bowler, the combination comprising

an inclined frame adapted to be pivotally supported at its lower end within said housing

compressible tire means rotatably supported on the lower portion of the frame in spaced relationship to its pivot end and adapted to be placed partially in the path of a bowling ball returning on said track from the pin deck,

roller means supported on the upper portion of said frame adjacent the end opposite the pivot end,

an endless belt passing around the tire means and said roller means and having an inclined ball-engaging span,

means for rotating said tire, said belt and roller,

said frame being positionable within the housing to normally rotatably support the tire means partially in the path of a ball returning from the pin deck end and beyond the pivot means in the direction of travel of the ball so that a returning ball is wedged under the belt and rotating compressible tire means and said frame pivots away from a returning ball to absorb the impact of the ball and to roll the ball under the tire means and onto the inclined ball-engaging span of the belt,

said ball-engaging span of the endless belt adapted to be placed in spaced relation to an inclined ball lifting means a sufficient distance to cause the ball to be frictionally engaged with the belt and roll up the ball lifting means,

said roller means being positionable adjacent the storage tray, whereby balls rolled up the inclined ball lifting means are rolled onto the storage tray.

4,640,512

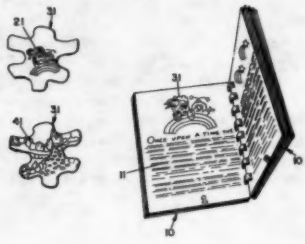
INTERACTIVE BOOK-PUZZLE INSTRUCTIONAL ENTERTAINMENT SYSTEM

William B. Burke, 407 Nassau Dr., Springfield, Mass. 01129

Continuation-in-part of Ser. No. 779,629, Sep. 24, 1985. This application Feb. 24, 1986, Ser. No. 832,023

Int. Cl.[4] A63F *9/10*

U.S. Cl. 273—157 R **1 Claim**



1. An interactive book-puzzle instructional entertainment system comprising:

a story book of consecutively-arranged pages with different indicia and a portion of a complemental supporting story imprinted on each of the consecutive pages,

and a jigsaw puzzle including a plurality of separable playing pieces,

with each playing piece bearing on one side a duplicate representation of an indicia appearing on one of the pages of the book and bearing on the opposite side a portion of a complete picture,

all adapted and arranged for a participant to successively match the indicia of each page of the book with the indicia on each playing piece with each successive piece being playable according to the consecutive order of their appearance in the book,

the pieces being playable consecutively,

each being interlocked in a manner where the second to be played piece is interjoined with the first to be played piece and the third to be played piece is interjoined somewhere along the continuous edge provided by the previously interjoined first and second pieces,

with each successively coded piece being interjoined somewhere along the continuous edge provided by the previously interjoined pieces.

4,640,513

SUPER MEMORY EDUCATIONAL GAME OF SKILL AND CHANCE

Robert Montijo, P.O. Box 629, Brooklyn, N.Y. 11211

Filed May 10, 1985, Ser. No. 732,584

Int. Cl.[4] A63F *3/00, 9/18*

U.S. Cl. 273—249 **11 Claims**

1. A super memory educational game of skill and chance which comprises:

(a) a circular game board having consecutive spaces defining a path of travel, a plurality of said spaces having color codes with game symbols identifying games including a pronounciation game, a define game, a super spelling bee game, a thinker game and a photo memory game, and numbered score points imprinted thereon, two spaces showing direction and final space being a winner jack pot;

(b) a plurality of playing pieces for use by players, said playing pieces being positionable on said spaces;

(c) a plurality of vocabulary card with word definition usage and correct spelling there on to be used when one of said playing pieces lands on one of said spaced indicating pronunciation, define, and super spelling bee games;

(d) a plurality of trivia multiple choice and true or false question cards in an intermixed assortment to be used

when one of said playing pieces lands on one of said spaces indicating thinker game;

(e) a plurality of photo memory game presentation cards having a series of numbers thereon to be used when one of said playing pieces lands on one of said spaces indicating photo memory game;

(f) a paper pad having a plurality of sheets with illustrated blank squares to be filled in when playing photo memory game;

(g) Check-a-Chip game board having three vertical by five horizontal rows of fifteen squares to be used when one of said playing pieces lands on said space indicating check-a-chip game;

(h) Fifteen chips to be used for said check a chip game; and

(i) a bonus unit device to be used after one of said players properly plays one of said games and including chance determining means for matching with said game just played whereby said player piece can advance an additional space.

4,640,514

OPTOELECTRONIC TARGET PRACTICE APPARATUS

Risto Myllylä ; Harri Kopola; Juha Kostamovaara, and Raimo Ahola, all of Oulu, Finland, assignors to Noptel Ky, Oulu, Finland

Filed Feb. 20, 1985, Ser. No. 703,414
Claims priority, application Finland, Feb. 24, 1984, 840766
Int. Cl.[4] F41J *5/02*
U.S. Cl. 273—310 **6 Claims**

1. An apparatus for dry-run target practice using firearms, such as pistols and rifles, which are to be used in competition, comprising: an integrated transmitter/receiver means for attachment to the barrel of a firearm, and a target having one portion defining a first area for aiming the sights of the firearm and another portion separated therefrom and defining a second area which exhibits significantly different light reflectivity than that of a third area surrounding said second area, said first and second areas being variable independently of each other as to their size and position;

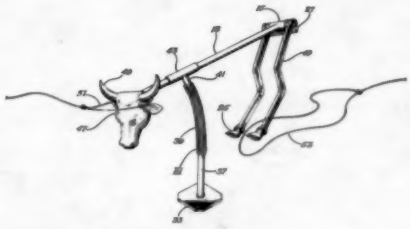
said transmitter/receiver means further comprising means for generating and transmitting a light beam pulse to said second or third area of said target exhibiting greater light reflectivity, upon actuation of the trigger of the firearm, means for receiving a reflected light beam pulse from said second or third area of greater reflectivity, and means for detecting and indicating that a reflected light beam has been received by said receiver means, whereby an operator of the firearm can ascertain whether or not he would have hit or missed the first area of the target at which he has aimed.

4,640,515

MECHANICAL ROPING STEER

Art Rhine, Box 1278, Pampa, Tex. 79065

Filed Feb. 10, 1986, Ser. No. 827,735
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—339 **6 Claims**



1. An apparatus for use in practicing team steer roping, comprising in combination:

a longitudinal frame member;

a pair of rear legs;

mounting means for mounting the upper ends of the legs to the rearward end of the longitudinal frame member to allow pivotal swinging movement of the legs relative to the longitudinal frame member, the legs having lower ends adapted to contact the ground to support the rearward end of the longitudinal frame member;

a pair of horn members mounted to the forward end of the longitudinal frame member;

a forward support member having an upper end connected to the longitudinal frame member between the horn members and the legs, and a lower end adapted for contact with the ground to support the forward end of the longitudinal frame member; and

flexible means in the forward support member for allowing the forward support member to flex forwardly and laterally when the horn members are roped and pulled sideways repeatingly, for causing the lower ends of the legs to repeatingly raise above the ground and pivot forwardly, to position the lower ends of the legs for roping.

4,640,516

METALLIC SEAL WITH INTERLOCKING J-SHAPED LIPS

Edward M. Almada, 7537 Linden St., Hammond, Ind. 46224

Division of Ser. No. 634,140, Jul. 25, 1984, Pat. No. 4,585,023.
This application Feb. 18, 1986, Ser. No. 829,933
Int. Cl.[4] F16J *15/06*
U.S. Cl. 277—236 **1 Claim**

1. A mechanical seal for a shaft exit, comprising:

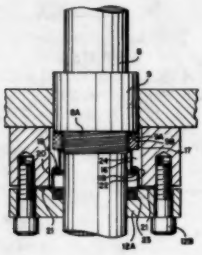
a shaft having a threaded portion thereon;

a fixed housing;

a first flange having a J-shaped lip, said first flange being secured to a flange clamping nut located on said threaded portion of said shaft;

a second flange having a J-shaped lip, said second flange adapted to be fixed to said housing, said lip of said first flange being oppositely disposed with respect to said lip of said second flange, said lips overlapping to define an annular chamber;

a sealing ring disposed within the annular chamber defined by said lips;



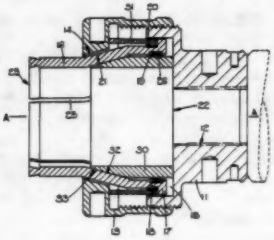
whereby said clamping nut is tightened on said shaft, thereby urging said lips of said flanges into intimate contact with said sealing ring.

4,640,517

COLLET CHUCK

John Lovatt, West View, Rock Cross Nr Kidderminster DY14 9SF, England

Filed Feb. 17, 1984, Ser. No. 581,361
Claims priority, application United Kingdom, Mar. 16, 1983, 8307185
Int. Cl.⁴ B23B 31/20
U.S. Cl. 279—2 R 7 Claims



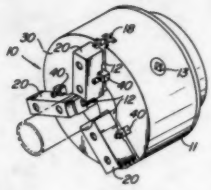
1. A Collet chuck comprising a body having means for securing to a machine tool shaft so that the axis of said body is aligned with that of said shaft, a plurality of jaws mounted in said body, an outer sleeve surrounding said jaws and being axially movable relative to said body, said jaws being separate arcuate elements, and positioning means axially movable with said jaws for maintaining the latter in relative axial alignment and circumferential spacing, each of said jaws having an outer face and an abutment which latter can coact with a spacer which can engage said outer sleeve to prevent engagement thereof with the outer faces of said jaws, said jaws also having inner faces inclined to said axis of the body which can engage with an inner sleeve as a result of coaction between said abutments and said spacer, whereby in the absence of said spacer and inner sleeve and axial movement of said outer sleeve results in engagement of said outer sleeve with the outer faces of said jaws to urge said jaws radially inwardly, and in the presence of said spacer an inner sleeve the same axial movement of said outer sleeve results in engagement of said inner sleeve with the inner faces of said jaws to urge said jaws radially outwardly.

4,640,518

JAW LOCKING MEANS FOR LATHE CHUCKS

Thomas A. Ferraro, Hatfield, Pa., assignor to Lock Jaws, Inc., Ambler, Pa.

Filed Nov. 19, 1984, Ser. No. 672,480
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.⁴ B23B 31/10
U.S. Cl. 279—123 10 Claims



1. In a lathe chuck having a master jaw guided for sliding movement relative to the chuck body in ways in the chuck body extending radially to the chuck axis by the jaw setting means of the lathe to a workpiece holding position, and a soft jaw mounted on and secured to the master jaw for conjoint movement therewith as a unit, the master jaw and the soft jaw being mounted for movement across the face of the lathe chuck as the master jaw slides in the ways, the ways and the master jaw having opposed surface portions limiting movement of the master jaw toward the chuck face, the improvement comprising

means for frictionally locking said master jaw and soft jaw unit in a fixed position relative to the chuck body including

a pair of body portions extending laterally from sidewalls of the soft jaw in generally parallel relation to the chuck face,

locking members extending from said laterally extending portions of said soft jaw towards the chuck face for frictionally engaging the same at the ends of said locking members, and

actuating means for causing the ends of said locking members to come into frictional engagement with the chuck face and said soft jaw to move away from said chuck face to cause said opposed surface portions of said master jaw and the ways to be frictionally engaged so that said master jaw and soft jaw unit is frictionally locked in a fixed position relative to the chuck body.

4,640,519

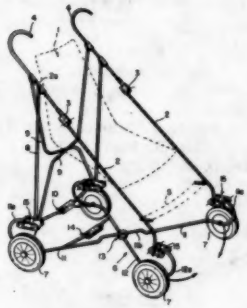
LIGHT PUSH CHAIRS OF THE FOLDABLE TYPE

Jean Bigo, c/o 1 ter, avenue du Hem, 59246 Mons en Pevele, France

Continuation of Ser. No. 288,389, Jul. 30, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 581,224
Claims priority, application France, Jul. 31, 1980, 80 16984
Int. Cl.⁴ B62B 7/06
U.S. Cl. 280—42 6 Claims

1. A light-weight foldable push chair of the baby-buggy type comprising two foldable side bars on which a basket is supported, and extending slopingly back from lower ends thereof to upper portions thereof, with push handles provided at their upper portions; two rear side bars each having an upper end pivotally coupled to an associated one of the first-mentioned side bars and a lower end; an articulated stay formed of crossed members having lower ends coupled to the associated lower ends of the rear side bars and upper ends coupled to the upper portions of the first-mentioned side bars; four wheels having axle means for mounting the same; a frame for mounting the axle means of said four wheels, the frame being formed of two foldable arms configured in a horizontal cross and articulated at a center portion for folding together, each said arm having

an upwardly curving C-shaped portion at each end of the arm and ending at a free end, with the axle means for an associated wheel being mounted on said frame arms in advance of the associated C-shaped portion; Daumont-type suspended link members non-rigidly joining the free ends of said upwardly curving portions of said foldable frame arms to the respective lower ends of the first-mentioned bars and of the rear side bars so that the suspension means effectively behaves as if the axle means were located between the central articulation point of said foldable arms and the respective intersecting plane of said side arms on said lower extending foldable arms to provide increased support and stability to the chair; an articulated strut



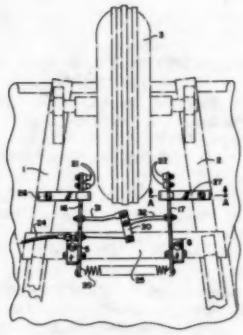
pivotally connecting each horizontal cross frame arm thereof to lock the same into an open position and rigidly retaining the horizontal cross frame arms in generally the same horizontal plane to prevent imbalance; and the horizontal cross frame arms, each having an upwardly curving C-shaped portion at each end of the arms, axle means being mounted in advance of the C-shaped portion, the Daumont-type connecting link members non-rigidly joining the free end of the upwardly curving portions to respective lower ends of the first-mentioned bars and of the rear side bars, and the articulated strut all cooperating to retain in a generally parallel alignment the corresponding wheels of the chair to prevent imbalance during use.

4,640,520

BRAKE DEVICE

Anders Wing, Hagaberg, Grimared, 439 29 Veddige, and Christer Nicklasson, Skanegatan 116, 432 00 Varberg, both of Sweden

Filed Feb. 5, 1985, Ser. No. 698,483
Claims priority, application Sweden, Feb. 13, 1984, 8400741
Int. Cl.[4] B62B 1/18
U.S. Cl. 280—47.31 **5 Claims**



1. A device for braking at least one wheel in a cart, for example a wheelbarrow, which has a frame including a pair of shafts, a wheel mounted between the shafts at one end thereof, said shafts having opposite ends provided with handle portions for maneuvering the cart,

said braking device comprising two brake levers which extend along a said shaft, brake shoes mounted on said brake levers, connection means including first and second pivots for mounting each brake lever on the frame, said first pivot supporting its respective brake lever for pivotal movement about a first pivot axis to and from a braking position where the brake shoe engages the wheel, means for biasing each brake lever for movement away from said braking position, operating means for moving each brake lever about said first pivot axis to bring the brake shoe against the wheel,

said second pivot mounting its respective brake lever for pivotal adjusting movement about a second pivot axis, said second pivot being oriented to provide an adjustment of the angle between the brake lever and the first pivot axis,

said operating means including a brake cable, booster means with input and output connections connected respectively to the brake cable and said brake levers, said booster means being operable to provide forces at the output connections which are greater than the force exerted by said brake cable at the input connection,

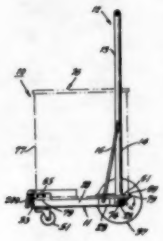
said booster means being a booster lever which has one end connected to the cable and another end with two pivots, and arms which connect said pivots to said brake levers.

4,640,521

DOLLY WITH TANK LATCH

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Feb. 19, 1985, Ser. No. 703,088
Int. Cl.[4] B62B 1/10
U.S. Cl. 280—47.34 **20 Claims**



1. A dolly for movably supporting a tank having a circular side-wall, a closed bottom and an outwardly extending bead on the side-wall at the bottom thereof, said dolly including:

a base, a wheel means on said base for horizontally positioning the latter, and releasable latch means on said base for maintaining a tank supported by said base from below latched to said base;

said base being frame-like and including a rear section, a front section, and side sections extending from opposite ends of said rear section to said front section;

said front section having inwardly protruding means operatively positioned to extend slightly above the bead of a tank supported on said rear section and said side sections;

said latch means including a holding portion disposed outside said base in the vicinity of said rear section and being movable relative thereto, while remaining on said base, between a raised tank latching position and a lowered tank releasing position;

said holding portion when moved from said releasing position to said latching position snapping over said bead and

forcing said bead forward under said inwardly protruding means to lock said tank to said base;

said rear section and said side sections including walls having notch means extending downward from upper edges thereof;

said notch means being adapted to receive a bead of a tank supported by said base to operatively position such tank on said base for cooperation of such bead with said holding portion and said inwardly protruding means to lock said tank to said base when said holding portion is in said latching position;

said notch means being proportioned to permit limited rearward movement of a tank supported by said base, when said holding portion is in said releasing position, to a position wherein the bead is clear of said inwardly protruding means to permit dismounting such tank from said base.

4,640,522

DRAFT LINK SWAY BLOCK

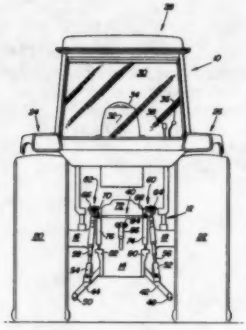
Christian M. Teich, Mannheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

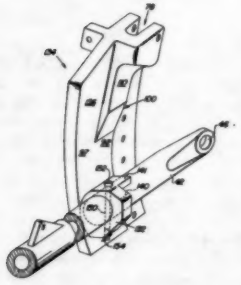
Continuation of Ser. No. 615,861, May 31, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 857,384

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322551

Int. Cl.[4] A01B *59/41*; B60D *7/00*

U.S. Cl. 280—460 A **11 Claims**





1. An assembly for limiting sway of a draft link of a tractor comprising:

a bracket fixed to a frame of the tractor, the bracket having a nearly vertical, generally L-shaped sliding surface with upper and lower portions, the lower portion having a longer length in the fore-and-aft direction and the upper portion having a shorter length in the fore-and-aft direction, the bracket also having a stop member projecting therefrom and located to one side of the upper surface portion and above the lower surface portion, and

an adapter mounted on the draft link for sliding engagement with the bracket sliding surface, the adapter being rotatable and shiftable into a plurality of settings, the adapter comprising a first portion with a shorter fore-and-aft length corresponding to the shorter length of the upper portion of the bracket sliding surface and a second portion having a longer fore-and-aft length corresponding to the longer length of the lower portion of the bracket sliding surface, the second portion being engageable with the stop member when the draft link is in a transport position.

4,640,523

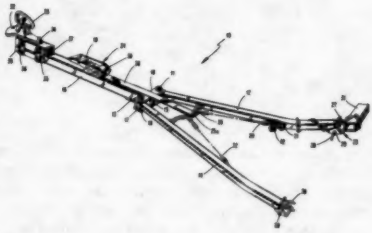
HITCH ASSEMBLY

Johann R. Wolmarans, 2 Cornelius, Glen Marais, Campton Park 16280, South Africa

Filed Jun. 11, 1985, Ser. No. 743,552

Int. Cl.[4] B60D *1/14*

U.S. Cl. 280—491 D **20 Claims**



1. A hitch assembly for a vehicle having front and rear axle frame structures, said assembly comprising:

(a) a boom portion including means for coupling to another hitch mechanism;

(b) two leg members mounted to the boom portion and being movable with respect to each other;

(c) each leg member including a contact end for abutting an axle frame structure of a vehicle;

(d) flexible line means extending outwardly from each of the contact ends of the leg members to wrap at a location around the axle frame structure against which each contact end abuts; and

(e) means mounted on the assembly for pulling the line means at a location laterally displaced rearwardly from the contact ends to cause tightening of the line means wrapped around each location on the respective axle structure while at the same time urging the two leg members inwardly with respect to each other.

4,640,524

SKI BINDING WITH SCREW RETAINING CONSTRUCTION

Gerhard Sedlmair, Farchant, Fed. Rep. of Germany, assignor to Marker International, Salt Lake City, Utah

PCT No. PCT/EP85/00150, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Pub. No. WO85/04695, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 3, 1985, Ser. No. 810,289

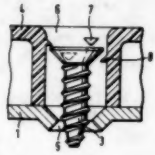
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 8410539[U]

Int. Cl.[4] F16B *39/00*

U.S. Cl. 280—611 **12 Claims**

1. A screw retainer for retaining a screw having an enlarged head with a predetermined diameter in a first member which is to be attached to a second member, such as a ski binding part and a base plate, by means of said screw retainer, said screw retainer comprising: an outer wall in the first member defining

a longitudinal bore having an outer entrance and a head receiving portion with a diameter larger than the diameter of the head of the screw, at least one first elastic projection near said entrace extending from said outer wall into said bore in the projected area of the head of a screw in said head receiving portion for blocking the withdrawal of a screw whose head is in said head receiving portion, and at least one second elastic projection spaced longitudinally inwardly from said first projection by at least the length of the head of the screw and



extending from said outer wall into said bore in the projected area of a screw head in said head receiving portion, said first and second projections being adapted to bend away from said entrance to permit entry of the screw head into said bore past said projections and to resist removal of the screw from said bore by engaging the top of the screw head, and said first and second projections being further adapted to retain a screw head between said first and second projections in the first member prior to attachment to the second member.

4,640,525

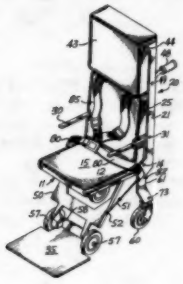
FOLDING WHEELCHAIR

Tom M. Jensen, Everett; Frederick T. Yoshimura, Seattle, and Deborah P. Jensen, Everett, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 19, 1985, Ser. No. 811,068

Int. Cl.[4] B62B *7/08*

U.S. Cl. 280—642 **6 Claims**



1. The combination of a folding seat and a folding wheelchair configuration, comprising: a back frame having a pair of vertically parallel side frame members and transverse frame members secured between said pair of side frame members for integrally forming a rigid back frame; latch means for removably securing said back frame to a wall which serves as connective support structure when the folding seat configuration is utilized; a seat pan frame extending horizontally forward from said back frame when in a lowered position for occupancy and being pivotally supported at its aft end to said back frame for limited articulation between a forward extended, horizontal position for occupancy and a rearward retracted, vertical position for stowage; said seat pan frame having side frame members incorporating a lengthwise orientated slot with a locking detent; rear legs formed by a lower extension of said back frame; front legs having their upper end slidably connected through said lengthwise orientated slot in the seat side frame members for forward extension or rearward retraction of the upper end of the front legs in said slot relative to the rear legs; said front legs having their upper end extended forward in said slot when the seat pan frame is lowered for occupancy and having their lower ends maintained by said latch means in a rearward retracted position adjacent to the lower extent of the rear legs, thereby forming a diagonal, ground-to-seat, support brace for seating load reaction; said back frame and the lower end of the front legs, being detached through said latch means from the wall for forming a self-supporting wheelchair configuration; said front legs, for the unfolded wheelchair configuration, having their lower ends extended forward from the rear legs and having their upper ends locked in a forward extended position by said locking detent; a folding link brace connected at its forward end to mid-length of the front legs and connected at its rearward end to said back frame for bracing the front legs in a forward extended position for the unfolded wheelchair configuration; and wheels mounted to the lower ends of the front and rear legs for rolling movement of the unfolded wheelchair configuration.

4,640,526

VEHICLE SUSPENSION APPARATUS

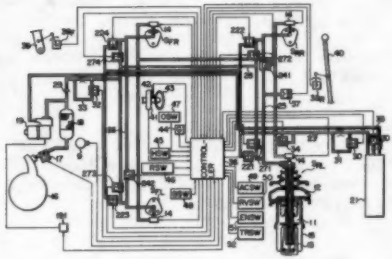
Tadao Tanaka, Okazaki; Sunao Chikamori, Nagoya; Mitsuhiko Harara, Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki; Naotake Kumagai, Aichi; Hiroki Abe, and Shozo Takizawa, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,373

Claims priority, application Japan, Apr. 25, 1984, 59-60918[U]; Apr. 25, 1984, 59-60919[U]; Apr. 25, 1984, 59-60921[U]; Mar. 29, 1985, 60-66099

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—707 **15 Claims**



1. A vehicle suspension apparatus comprising:

suspension units each provided for each wheel and each having an air spring chamber;

a reservoir tank for storing compressed air to be supplied through an air supply valve to said air spring chambers of said suspension units;

exhausting means for exhausting compressed air from said air spring chambers of said suspension units through an exhaust control valve;

a compressor driven by at least one of a vehicle running engine and an electrical power supply of the engine for supplying compressed air to said reservoir tank;

engine condition detecting means for detecting the rotation condition of the engine on the basis of the rotational speed of the engine after an engine switch for starting the engine has been turned on and for generating a signal when the rotation of the engine is stabilized; and

control means coupled to said engine condition detecting means for inhibiting the driving of said compressor until said engine condition detecting means detects that the

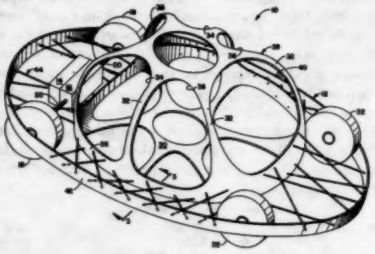
rotation of the engine has been stabilized after the start of the engine.

4,640,527

SAFETY VEHICLE

William D. Taylor, 1600 S. Orange Ave., Weslaco, Tex. 78596

Filed Nov. 15, 1985, Ser. No. 798,455
Int. Cl.[4] B60R *27/00*
U.S. Cl. 280—781 9 Claims



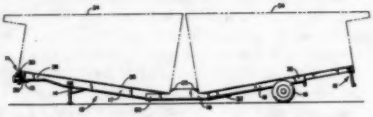
1. A motorized vehicle comprising
a frame; and
an engine, drive train and a plurality of wheels carried on the frame for propelling the vehicle;
the frame comprising
an inner rigid hub including a closed band;
a passenger compartment shell rigid with and carried by the inner hub;
an outer rim larger than and surrounding the inner hub; and
a multiplicity of stress transmitting members interconnecting the outer rim and inner hub, the members comprising elongate bodily rigid spokes and means maintaining the spokes in tension, the spokes comprising the only load supporting connection between the rim and the hub; and
dy shell on the exterior of the frame including a roof, a hood and a trunk lid.

4,640,528

TORSION-ABSORBING HIGHWAY SEMITRAILER

William C. Boyles, Osteen, Fla.; Douglas R. Hagge, Columbus, and Clifford V. Johnston, Hebron, both of Ohio, assignors to Cardinal Industries, Inc., Columbus, Ohio

Filed Jul. 30, 1985, Ser. No. 760,595
Int. Cl.[4] B62D *21/14*
U.S. Cl. 280—789 9 Claims



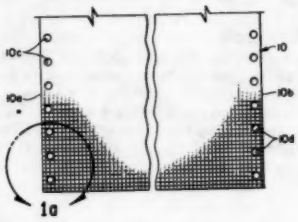
1. In a highway semitrailer adapted to carry cargo, that improvement which comprises:
(a) an elongated frame having a central cargo-supporting base portion, a first pair of laterally spaced apart beams projecting forwardly from the base portion and defining a front end portion of said frame, a second pair of laterally spaced apart beams projecting rearwardly from said base portion and defining a rear end portion of said frame, and at least two braces, each extending laterally between and affixed to one of said first and second pairs of beams;
(b) a front stabilizer assembly carried on the front end portion of the frame and provided with a laterally extending front cargo-supporting arm disposed for rocking movement in a generally vertical plane perpendicular to the first pair of beams; and
(c) a rear stabilizer assembly carried on the rear end portion of the frame and provided with a laterally extending rear cargo-supporting arm disposed for rocking movement in a generally vertical plane perpendicular to the second pair of beams.

4,640,529

FLEXIBLE NON-DISTORTABLE HANDCRAFT SHEET MATERIAL AND METHOD OF APPLYING PRINTED DESIGNS THERETO

Marcella M. Katz, 10573 Le Conte Ave., Los Angeles, Calif. 90024

Filed Sep. 16, 1985, Ser. No. 776,759
Int. Cl.[4] B42D *19/00*
U.S. Cl. 281—5 23 Claims



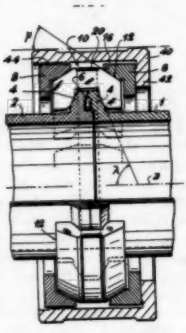
1. A flexible non-distortable handcraft sheet material having a print surface on at least one side thereof for receiving computer-generated print designs, patterns, and photographs as craft instructional or decorative visual information for use in creating finished handcrafted items incorporating the printed areas of said sheet material, said handcraft sheet material having alignment and feed means located along the edges thereof for moving said material through a computer-directed printer for imprinting a design, pattern or photograph on the print surface thereof.

4,640,530

TIGHT CONNECTION DEVICE

Claude Abbes, St. Etienne; Christian Rouaud, Bourg St. Andeol; Jean Valla, St. Etienne; Robert Forges, Bollene, and Raymond de Villepoix, Donzére, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 20, 1984, Ser. No. 602,372
Claims priority, application France, Apr. 27, 1983, 83 06962
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—18 15 Claims



1. A device for the tight connection of a first part to a second

part in a longitudinal direction along an axis D, the first and second parts having respective first and second flanges, each flange having a conical surface inclined at an angle λ with respect to the axis D, the device comprising two longitudinally movable clips, each clip having a conical surface at an angle μ with respect to axis D, and a radially movable intermediate member in the form of a ring constituted by a plurality of interconnected radially movable segments, each segment having a generally U-shaped cross-section and having an inner surface portion and an outer surface portion, the inner surface portion of each segment having first and second symmetrical conical surfaces inclined at an angle λ with respect to axis D for cooperating with corresponding ones of the conical surfaces of angle λ of the first and second flanges to move the flanges together upon the segments being moved radially inwardly, and the outer surface portion having third and fourth symmetrical conical surfaces inclined at an angle μ with respect to axis D for cooperating with corresponding ones of the conical surfaces of angle μ of the clips, and means for bringing the clips together longitudinally along axis D so as to move said plurality of segments radially inwardly and force said first and second parts together.

4,640,531

ARRANGEMENT FOR CENTERING CONDUITS

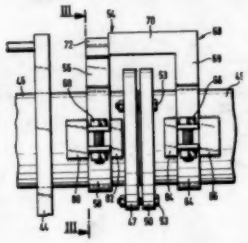
Jürgen Forster, Minden, and Helmüt Westendorf, Hanover, both of Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,444

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341044

Int. Cl.⁴ F16L *35/00*

U.S. Cl. 285—24 **7 Claims**



1. A centering arrangement for facilitating the remotely-manipulated connection of the end flange of a removable flanged conduit member to the end flange of a stationary flanged conduit member in an installation equipped with remote viewing apparatus and remote handling apparatus for moving the removable flanged conduit member in elevation relative to the stationary conduit member, the installation being a facility such as a large-area cell for reprocessing irradiated nuclear fuel, each of said conduit members defining a longitudinal axis and the centering arrangement comprising:

key means mounted on the outer surface of one of said conduit members and extending outwardly therefrom in a direction transverse to the longitudinal axis thereof, said key means terminating in an outermost tip;

centering means mounted on the outer surface of the other one of said conduit members;

said centering means including two mutually adjacent centering surfaces joined together to form an apex and define a trough-like centering structure for receiving the outermost tip of said key means in contact engagement therewith whereupon said key means and said centering structure coact to finely guide said removable flanged conduit member as the latter is moved in elevation perpendicularly to the longitudinal axis of said stationary member so as to cause said axes to become aligned with each other when said key means outermost tip seats in said apex whereby said conduit members can be joined to each other at said mutually adjacent flanges thereof; and,

said centering surfaces and the outermost tip of said key means being disposed in spaced relationship to said conduit members, respectively, so as to facilitate remote viewing with aid of said remote viewing apparatus during the remote handling of said removable flanged conduit member.

4,640,532

JOINING MEANS AND METHOD FOR JOINING METAL MEMBERS

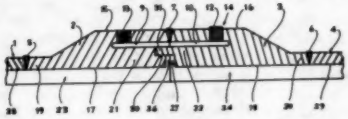
Paul B. Pope, Auckland, New Zealand, assignor to McConnell Dowell Constructors Limited, New Zealand

Filed Dec. 5, 1983, Ser. No. 557,930

Claims priority, application New Zealand, Dec. 10, 1982, 202768

Int. Cl.⁴ F16L *53/00*

U.S. Cl. 285—41 **4 Claims**



1. A coupler, comprising:

a body having an outside wall and an inside wall substantially opposite the outside wall, a first end and a second end substantially opposite the first end, the first end of the coupler in use being connectable by welding to a metal member, the second end in use being connectable by welding to the second end of another coupler at the outside wall of both couplers, the couplers having a slot open at the second end and interposed between the outside and inside walls at the second end so as in use substantially to reduce any transfer of heat towards the inside wall when welding the second end of the coupler to the second end of another similar coupler, the slot being displaced from the outside wall an amount at least equal to the thickness of the first end;

a passageway from the outside wall into said slot;

a rebate at the corner of the intersection of the second end and the inside wall; and

alignment means to align butted couplers so that their outside and inside walls are substantially aligned.

4,640,533

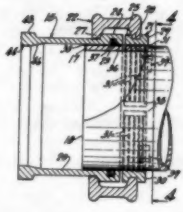
ADJUSTABLE PIPE EXTENDER FOR HIGH PRESSURE LINES CARRYING ABRASIVE MATERIALS

Robert E. Klemm, Milwaukee, Wis., assignor to Construction Forms, Inc., Cedarburg, Wis.

Filed Oct. 4, 1985, Ser. No. 784,798

Int. Cl.⁴ F16Z *27/12*

U.S. Cl. 285—62 **21 Claims**



1. In a concrete pumping system, comprising a plurality of

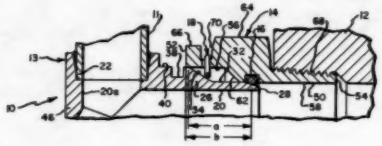
essentially identical line pipe sections mounted in aligned end to end relationship, each of said pipe sections being of a standard length and having annular clamping shoulder portions, coupling units for firmly connecting adjacent pipe sections, said system including at least one pair of coupling locations spaced from each other by a distance less than said standard length, a special pipe section interposed between said locations and having a clamping shoulder portion on only one end thereof for coupling to an adjacent line pipe section, a high pressure pipe extender unit coupled to said special pipe section for adjusting the length of said special pipe section to close said space between said locations, said special pipe section having a constant diameter free end, said extender unit comprising an extender pipe telescoped over the free end of said special pipe section and thereby forming an extension thereof, sealing means interposed being the opposed peripheral surfaces of said extender pipe and said special pipe section, a plurality of arcuate jaw members circumferentially distributed about said special pipe section immediately adjacent the telescoped end of said special pipe, said extender pipe and said jaw members including circumferential shoulder projections, a multiple-piece annular coupling means encircling said adjacent shoulders of said extender pipe and said jaw members for clamping the jaw members to said special pipe section and for interconnecting of said pipe extender to said pipe jaws and thereby firmly affixing said extender pipe to said special pipe section and forming a rigid extension thereof, and a coupling unit of said spaced coupling units connecting said clamping shoulder portion of said special pipe section to said adjacent line pipe section.

4,640,534

FLUID COUPLING ASSEMBLY

John T. Hoskins, 16 Cobblestone Ct., Orchard Park, N.Y. 14127; Steven R. Zillig, and James E. Caroll, both of Williamsville, N.Y., assignors to John T. Hoskins and Robert G. Zillig

Filed Mar. 14, 1986, Ser. No. 840,111
Int. Cl.[4] F16L *37/14*
U.S. Cl. 285—158 **3 Claims**



1. A fluid coupling for connecting a fluid line to a threaded port, the fluid coupling comprising in combination:

a male member having a bore which terminates at the free end of the member, the bore having a fluid line receiving portion at its other end, the exterior surface of the body of the male member further being provided with first and second reduced diameter cylindrical surface, a first tapered portion between the first reduced diameter surface and the free end of the fitting, an enlarged diameter cylindrical portion between the first and second reduced diameter cylindrical portions, a radially outwardly extending shoulder surface between the second reduced diameter cylindrical portion and the enlarged diameter cylindrical portion, and a second tapered portion between said enlarged diameter cylindrical portion and the first reduced diameter cylindrical portion; and

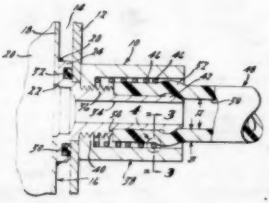
a female subassembly including a female member provided with a bore extending through the body of the female member from one end to the other end, the bore of the female member having an enlarged diameter cylindrical portion at the one end and a reduced diameter cylindrical portion adjacent the other end, the reduced diameter cylindrical portion being provided with an O-ring receiving groove, an O-ring disposed within said O-ring receiving groove, the diameter of the enlarged and reduced diameter cylindrical portions being just slightly greater than the diameter of the enlarged and first reduced diameter cylindrical portions of said male member, respectively, the distance from said one end of the bore of the female member to that portion of the O-ring which is initially contacted by the male member when inserted into the female member being essentially equal to or greater than the distance from the enlarged diameter exterior cylindrical surface portion of the male member to that portion of the first tapered portion of the male member which initially contacts the O-ring when the male member is inserted into the female member, the body of the female member having an enlarged diameter exterior surface portion between the ends, first and second reduced diameter exterior surface portions adjacent said one end and said other end, respectively, the first reduced diameter exterior surface portion having a spring clip receiving groove therein, and the second reduced diameter exterior surface portion being provided with threads for threading into said threaded port, the female member further being provided with slots extending between the spring clip receiving groove and the enlarged diameter cylindrical portion of the bore; and a spring clip carried at least partially within the spring clip receiving groove, the overall diameter of the spring clip being less than the diameter of the enlarged diameter exterior surface portion of the female member, and portions of the spring clip passing through the slots and disposed in juxtaposition to the shoulder surface of the male member to maintain the first reduced diameter exterior cylindrical surface portion of the male member in sealing relationship with said O-ring.

4,640,535

QUICK HOSE CONNECTOR

John T. Hermann, Livonia, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 27, 1985, Ser. No. 780,763
Int. Cl.[4] F16L *3/04*
U.S. Cl. 285—158 **5 Claims**



1. A connector for an elastic hose in the form of a composite assembly facilitating connection of a bare hose end thereto solely by insertive force on the hose, comprising:

an elongated nipple-shaped member having a cylindrical main body portion of slightly larger diameter than the inner diameter of the hose, the nipple portion also having an end base portion of significantly larger diameter than the body portion to form a stop for limiting the insertion of the hose over the body portion of the nipple member and the nipple member further having a relatively large diameter bead portion on the end opposite the base portion to first receive the hose thereover when it is pushed over the fitting to cause the hose to be radially enlarged in the vicinity of the bead portion;

a housing with a hollow cylindrical interior coaxially encircling the main body portion of the nipple-shaped member,

the housing having an end wall attached to the nipple member near the base portion thereof and further having an opposite open end forming a radial space about the bead portion of the nipple sufficient to permit insertion of the bare hose end therethrough;

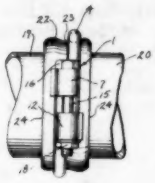
an elongated coil-type wire spring coaxially within the cylindrical interior of the housing with one end thereof engaging the housing base portion and an opposite free end terminating near the nipple's bead portion, the coil spring having a generally tubular shape with an outer diameter and an inner diameter defining a cylindrical spring interior whereby insertive movement of the hose end into the housing and over the nipple causes the hose portion extending over the main body portion and past the bead portion of the nipple to slide into the interior of the coil spring and produce a tightly gripping operative connection with the inner diameter spring portion when an opposite disconnecting force is exerted on the hose which causes the free end of the coil spring to move slightly with the hose toward the radially enlarged portion caused by the bead portion thereby causing the outer surface of the hose to press against and portions thereof to move between the coils of the spring.

4,640,536

TUBE CLAMP ASSEMBLY

Frederick H. Printiss, Sr., and Irvy T. Barker, both of Stoughton, Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Feb. 27, 1986, Ser. No. 833,544
Int. Cl.[4] F16L *19/02*
U.S. Cl. 285—367 **12 Claims**



1. A clamp assembly for clamping overlapping ends of metal tubes, comprising a ring having a pair of overlapping ends disposed in direct contact with each other, and a generally U-shaped bracket for each of said ends, said U-shaped bracket having opposing legs and means securing one leg of each bracket to one of said ends and the opposite leg of said bracket being disposed in contact with the outer surface of the other of said ends whereby said other end can slide relative to the respective bracket, each bracket defining an opening with said openings being in alignment, and fastening means extending freely through said aligned openings for drawing said brackets in a direction toward each other to contract said ring and clamp said tubes.

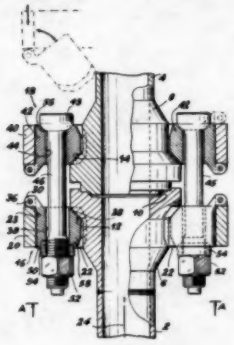
4,640,537

JOINING MEANS BETWEEN TWO PIPES HAVING RETRACTABLE BEARING MEMBERS

Jean-Edmond Chaix, Pierrevert, and Michel Metteey, Eguilles, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 9, 1986, Ser. No. 817,459
Claims priority, application France, Jan. 18, 1985, 85 00722
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—368 **9 Claims**

1. A joining means between two pipes, each of which is provided with a collar having a given external diameter and able to compress a gasket between these two collars, said means having two flanges perforated with aligned holes and having an internal diameter smaller than the external diameter of the collars, so as to be able to bear against the latter, as well as tightening means traversing the holes formed in the flanges in order to apply thereto a force tending to move them together and compress the gasket between the collars, wherein at least one of said flanges is an assembly comprising an external cylindrical ring having an internal diameter larger than the



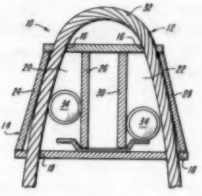
external diameter of the collars and bearing parts positioned in an inner position within said ring and in which are formed said holes, each bearing part being articulated on a lateral face of the ring, so as to be able to tilt into an outer position in which the internal diameter of the assembly substantially corresponding to the internal diameter of the ring.

4,640,538

SECURITY SEAL

Terrence N. Brammall, Angola, Ind., assignor to Trans-Guard Industries Inc., Angola, Ind.

Filed Oct. 29, 1985, Ser. No. 792,447
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—323 **9 Claims**



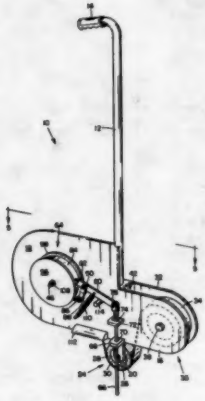
1. A security seal of the type which utilizes a stranded cable as a shackle, said cable being of the type that includes spiral wound filaments on the exterior surface, said seal body having an internal channel for receiving the cable, and a cable locking element associated with said channel, said element being a disc having a series of parallel grooves in the peripheral surface, said surface being positioned for engagement with an inserted cable, said grooves having a configuration enabling it to mesh with the filaments on the external surface of the cable so as to prevent rotation of the cable in the housing.

4,640,539

DEVICE FOR PICKING UP SMALL PIECES OF LITTER

Allen R. La Porte, 240 Jones Rd., Kerrville, Tex. 78028

Filed Oct. 21, 1985, Ser. No. 789,320
Int. Cl.[4] A47L *13/00*
U.S. Cl. 294—19.1 6 Claims



1. A device for picking up small pieces of litter, using a roll of tape that is sticky on one side, comprising:

a rod of a rigid material having a length generally equal in length to a walking cane;

a handle located on an upper end of said rod;

a means for mounting a pick-up roller, said pick-up roller mounting means being located on the lower end of said rod, said pick-up roller mounting means including roller flanges extending downward from said rod, and a pick-up roller axle between said roller flanges;

a roller mounted on said roller axle, said roller having a rigid inner cylinder and a resilient outer cylinder bonded thereto for pressing said sticky side of said tape against said small pieces of litter;

a means for dispensing tape, said dispensing means including a dispensing reel located above and in front of said roller, with the axis of rotation of said dispensing reel being parallel to the axis of rotation of said roller, said dispensing reel comprising a hub between a dispensing plate and dispensing back plate, said dispensing plate being attached to said rod near said lower end thereof and mounted on a first side of and above said pick-up roller, said dispensing back plate being located on the opposite side of said rod from said dispensing plate;

a means for taking-up tape, said take-up means including a take-up plate attached to said rod near the lower end thereof and mounted on a second side of and above said roller means, and a take-up reel rotatably mounted cylinder mounted on said take-up plate, said take-up reel being a cylinder, an external end of said cylinder being open and having slot therein parallel to the axis of rotation of said take-up reel, said slots being of sufficient size to receive a starting end of said tape;

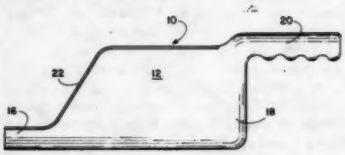
a means for advancing said tape including an actuating rod extending below said pick-up roller means and a means for rotating said take-up reel, said actuating rod being movable in a generally vertical direction, said actuating rod being pivotally connected to said take-up means to cause rotation with a first direction of motion of said actuating rod but not in a second direction of motion of said actuating rod, spring means for returning said actuating rod to a lowermost position.

4,640,540

GUTTER CLEANING TOOL

Bruce Chisholm, 4141 S. Marigold, Portland, Oreg. 97219

Filed Nov. 22, 1985, Ser. No. 800,685
Int. Cl.[4] A47F *13/08*; E04D *13/06*
U.S. Cl. 294—55 7 Claims



1. A tool for removing debris from a rain gutter having a generally U-shaped cavity, said tool comprising:

(a) a U-shaped scoop having open and closed ends and an integral bottom and side walls, said side walls being easily deflected sufficiently to permit a scoop having a larger transverse dimension than a particular gutter cavity to be inserted into the gutter cavity and conform to the shape of the gutter cavity when inserted therein;

(b) a heel located at the closed end of said scoop which is narrower than the remainder of said scoop and which is relatively inflexible; and

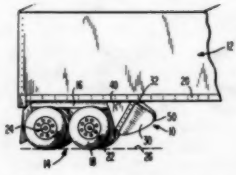
(c) handle means for inserting said heel into a gutter and for thereafter rotating the tool to conformingly insert said scoop into said gutter.

4,640,541

UNDER-TRAILER AIR DEFLECTOR

Joseph M. FitzGerald, and James P. FitzGerald, both of Buena Park, Calif., assignors to FitzGerald Corporation, Buena Park, Calif.

Filed Sep. 17, 1985, Ser. No. 776,845
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S 11 Claims



1. An air deflector for reducing the aerodynamic drag of the wheels of a rear wheel assembly for vehicles such as trucks and trailers and for suppressing the spraying of water by such wheels, comprising:

an aerodynamic fairing adapted to be mounted beneath the body of a vehicle and immediately forward of a rear wheel assembly of the vehicle, said fairing including:

top, bottom, and first and second side edges defining a generally rectangular fairing body for extending laterally completely across the body of the vehicle and for extending beyond the rear wheel assembly on each side of the vehicle;

a continuous, contoured front fairing surface extending away from said top, bottom, and side edges and converging from said edges to an area of maximum extension located between said side edges, said front fairing surface being curved substantially symmetrically in a lateral direction about a vertical plane passing through the center line of said fairing so that a part of any impinging air is directed toward said first and second side edges and around the rear wheel assembly of a vehicle;

said fairing surface being curved asymmetrically in a vertical

direction, with said area of maximum extension being disposed above the center of said fairing so that the distance along the lower fairing surface between said area of maximum extension and said bottom edge is substantially longer than the distance along the fairing surface between said area of maximum extension and said top edge, the lower fairing surface curving laterally, downwardly and rearwardly toward said side and bottom edges and the upper fairing surface curving laterally, upwardly and rearwardly toward said side and top edges; and

said fairing being adapted to extend downwardly from said vehicle body so that a portion of any impinging air is directed downwardly beneath and between the wheels of the rear wheel assembly and the remaining impinging air is directed laterally around the wheels of the rear wheel assembly to suppress water spray and to reduce the aerodynamic drag of the wheel assembly.

4,640,542

MOBILE TELEPHONE MOUNT FOR A VEHICLE

Sheldon J. Watjer, Holland, and Edward T. Boerema, Zeeland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Aug. 6, 1985, Ser. No. 762,879
Int. Cl.⁴ B60R *7/04*
U.S. Cl. 296—37.8 **26 Claims**

1. A telephone mount for use in an automobile, comprising:

a telephone unit storage housing having an access opening thereto;

a telephone carriage including a telephone receiver mounted thereon, said carriage being movable between a storage position in which said carriage locates said telephone receiver carried thereon within said storage housing and a use position in which said carriage locates at least a portion of said telephone receiver carried thereon through said access opening; and

means for mounting said carriage in said housing for movement in an arcuate path from said storage position to said use position, whereby said carriage moves the telephone receive between said storage position within said housing and a position at least partially extended from said housing to said use position in which an operator can operate the telephone receiver.

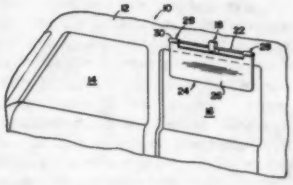
4,640,543

VEHICLE REAR SEAT SUN VISOR

John W. Bradley, 2461 66th Ter. South, St. Petersburg, Fla. 33712

Filed Dec. 11, 1984, Ser. No. 680,551
Int. Cl.⁴ B60J *3/00*
U.S. Cl. 296—97 K **4 Claims**

1. A sun visor assembly for side rear windows of an automotive vehicle comprising a clothes hanger hook for securement to a vehicle headliner, a bracket rigidly secured by said hook having a tubular portion disposed adjacent to and under the base of the hook, a rod supported on the tubular portion of the bracket and a one piece panel member having spaced apart



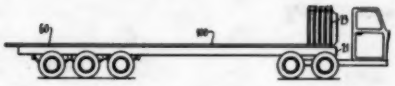
short vertically upward extending arms fixedly secured to the rod.

4,640,544

VEHICLE CONSTRUCTION

James R. McNamara, RMB 20, Whorouly, Victoria 3735, and Denis L. Piazza, Whalleys Lane, Myrtleford, Victoria 3737, both of Australia

Filed Oct. 19, 1984, Ser. No. 662,743
Claims priority, application Australia, Oct. 19, 1983, PG1917
Int. Cl.⁴ B60P *1/00*
U.S. Cl. 296—181 **14 Claims**



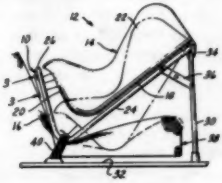
1. An enclosure adapted for use on a trailer or a vehicle flat bed comprising at least first and second panels on each side of the trailer, one end of the first panel of each side being hingedly connected to the trailer, or an extension therefrom, the panels on each side being hingedly connected to each other, a frame assembly extending transversely across the width of the trailer rearwardly of said second panels, the other ends of the second panel of each side being hingedly connected to said frame assembly, the frame assembly being movable longitudinally along the trailer to move the panels on each side from a first position, where they are located along the side of the trailer, to a position where these panels on each side move inwardly to extend across the trailer with the normally outwardly facing surfaces of the panels facing each other.

4,640,545

LOCK FOR VEHICLE INFANT RESTRAINT

Heinrich F. von Wimmersperg, 15721 Rosemont Rd., Detroit, Mich. 48223

Filed May 13, 1985, Ser. No. 733,117
Int. Cl.⁴ A47C *1/08*; B60N *1/12*
U.S. Cl. 297—216 **20 Claims**



1. A lock for a child restraint for use in a vehicle comprising, a catch, a bearing carried by said catch and being releasably engageable by a hook a support for said bearing carried by said

catch, a first arcuate surface on said support for engagement with said bearing, a latch, a hook carried by said latch and being movable to a first position wherein it engages said bearing to restrain movement in at least one direction of said latch with respect to said catch and to a second position wherein it is released from said bearing to permit movement in said one direction of said latch with respect to said catch, a second arcuate surface of said hook constructed and arranged to engage said bearing when said hook is in its first position, said bearing being a roller bearing disposed between said first and second surfaces when said hook is in its first position, a flyweight carried by said latch and movable from a first position to a second position due to inertia when the vehicle is rapidly decelerated in a frontal crash, a coupling of said flyweight with said hook so that when said flyweight moves to its second position said hook is moved to its second position to release said lock, and said flyweight has sufficient mass to produce sufficient force by inertia during such frontal crash to move said hook to its second position.

4,640,546

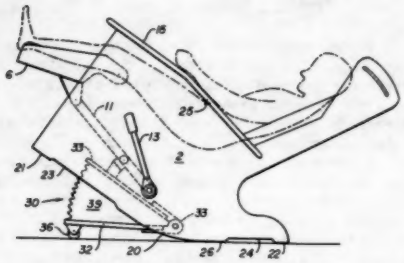
ROCKER-RECLINER CHAIR

Henry Aguilar, 61 Garcia Ave., San Francisco, Calif. 94127

Continuation of Ser. No. 577,416, Feb. 6, 1984. This application Dec. 24, 1985, Ser. No. 814,286

Int. Cl.[4] A47C *3/02*

U.S. Cl. 297—260 **11 Claims**



1. A rocker-recliner chair comprising:

a chair assembly having a seat surface configured to receive an occupant, and rocker surface adapted support said chair assembly on a floor surface such that said chair assembly may rock between a forward position and rearward position;

an inflatable and deflatable air-driven operator disposed between said chair assembly and said floor surface, said air-driven operator rocking said chair assembly rearwardly as it inflates and allowing said chair assembly to rock forwardly as it deflates;

forward sensing means provided proximate a forward portion of said rocker surface, said forward sensing means contacting said floor surface when said chair assembly is in said forward position;

rearward sensing means provided proximate a rearward portion of said rocker surface, said rearwrd sensing means contacting said floor surface when said chair assembly is in said rearward position;

inflation means coupled to said air-driven operator, said inflation means being responsive to said forward sensing means; and

deflation means coupled to said air-driven operator, said deflation means being responsive to said rearward sensing means.

4,640,547

ADJUSTABLE SWIVEL CHAIR

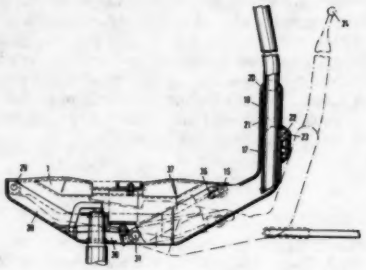
Heinrich Fromme, 27, Liemker Strasse, D-4815 Schloss Holte, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,111

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 8326792[U]

Int. Cl.[4] A47C *1/032*

U.S. Cl. 297—301 **12 Claims**



1. A chair mechanism comprising:

a chair stand assembly including a chair stand frame with a front end portion;

a seat holder with a forward portion;

a first pivotal connection between said forward portion of said seat holder and said front end portion of said chair stand frame, whereby said seat holder may pivot about a horizontal axis;

a backrest holder including an offset arm and a second portion coupled at an obtuse angle with the offset arm;

a second pivotal connection between a forward end portion of said offset arm and said chair stand frame, said second pivotal connection spaced rearwardly of said first pivotal connection, whereby said backrest holder may pivot relative to said chair stand frame about a second horizontal axis;

a third connection connecting said offset arm to a rear portion of said seat holder comprising a horizontally disposed pivot member affixed to one of said offset arm and said rear portion of the seat holder and a slot in the other of said offset arm and said rear portion, said slot receiving said pivot member, said slot extending in a linear direction defined through said second and third connections, whereby said pivot member may move in said slot so as to permit pivoting of said seat holder about said first pivotal connection simultaneously with pivoting of said backrest holder about said second pivotal connection;

means for selectively arresting movement of said pivot member in said slot, said selectively arresting means arranged between said second connection and said pivot member of the third connection so to fix the distance therebetween.

4,640,548

CHAIR WITH AN ADJUSTABLE BACKREST

Simon Desanta, Gutersloh, Fed. Rep. of Germany, assignor to Kusch & Co. Stizmobelwerke KG, Hallenberg, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,875

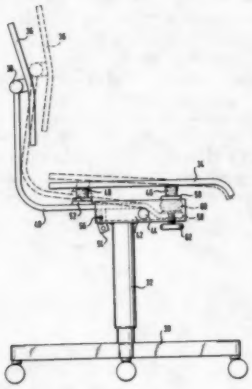
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139448

Int. Cl.[4] A47C *1/032*

U.S. Cl. 297—320 **9 Claims**

1. A chair, especially an office chair, having a vertical column with a seat mounted on said column and a backrest connected to said column by a curved supporting bar, means defining three hinge points, each having a horizontal trans-

verse axis, for respectively connecting the seat and the column, the column and the supporting bar and the supporting bar and the seat in a hinged triangular arrangement, wherein, when said backrest is reclined, said hinge point connecting the seat and the supporting bar is simultaneously vertically moved horizontally shifted between the seat and the supporting bar,



wherein said hinge points connecting the seat and the column on the one hand and the seat and the supporting bar on the other hand, respectively, are formed by rubber pads, whereby seat movement is divided into a shifting movement between the seat and the column on the one hand and between the seat and the supporting bar on the other hand.

4,640,549

HEADREST FOR A VEHICLE SEAT

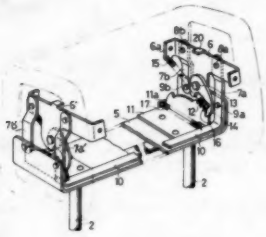
Masaaki Yokota, Akishima, Japan, assignor to Tachikawa Spring Co. Ltd, Tokyo, Japan

Filed May 29, 1985, Ser. No. 739,064

Claims priority, application Japan, May 31, 1984, 59-80778[U]

Int. Cl.⁴ A47C 7/36

U.S. Cl. 297—410 **1 Claim**



1. A headrest for a vehicle seat having stays extending downwards therefrom and supported on a seat back, said headrest comprising:

a fixed frame having a front and rear and left and right end portions, fixedly secured to the upper ends of said stays;

a pair of movable frames each being disposed above the respective left and right end portions of said fixed frame;

a pair of first parallel links each being at the upper end portion thereof pivotally connected to one of said pair of movable frames and being at the lower end portion thereof pivotally connected to one of the left and right ends of said fixed frame;

a pair of second parallel links each being at the upper end portion thereof pivotally connected to the other of said pair of movable frames and being at the lower end portion thereof pivotally connected to the other of the left and right ends of said fixed frame;

wherein both said pairs of first and second parallel links are of the arrangement that the links are in a parallel spaced-apart relationship with each other;

means for integrally connecting one link of said pair of first links with the opposite one link of said pair of second links;

a pair of lock plates provided on said fixed frame, each of said lock plates having a plurality of engagement teeth, a first projection and a second projection, with the arrangement being such that said plurality of engagement teeth are formed between said first and second projections;

a pair of stoppers each being pivotally fixed to a respective one of said pair of movable frames, each of said pair of stoppers having a first front end portion and a second rear end portion;

a pair of first biasing means each of said pair of first biasing means being respectively extended between one of said pair of stoppers and one of said pair of movable frames, each of said first biasing means being adapted for biasing a respective stopper in such a manner that, (i) when a respective movable frame is in a normal adjusting position, said first biasing means biases said respective stopper into engagement with a selected one of said plurality of engagement teeth on a respective lock plate, and (ii) when said pair of movable frames is moved forwardly of said fixed frame, causing said pair of stoppers to contact said first projection of said lock plate, said pair of first biasing means then biasingly rotates said pair of stoppers out of engagement with the selected one of said plurality of engagement teeth;

a pair of second biasing means each of said pair of second biasing means being respectively extended between said connecting means and the front portion of a respective lock plate, said pair of second biasing means being adapted for biasing said connecting means toward the front of said fixed frame, thereby biasing each of said pair of movable frames toward the rear of said fixed frame; and

means for limiting the rotational movement of said pair of stoppers, said limiting means being provided on each of said pair of movable frames.

4,640,550

ADJUSTABLE FASTENING DEVICE

Bengt E. W. Håkansson, Ekgatan 8, S-662 00 Åmål, Sweden

Filed Oct. 8, 1985, Ser. No. 785,469

Claims priority, application Sweden, Nov. 21, 1984, 8405851

Int. Cl.⁴ B60R 22/20

U.S. Cl. 297—483 **6 Claims**

1. Adjustable fastening device comprising a guide member mountable on a carrier so that a clearance is created between said guide member and said carrier, and a runner which may be

displaced along said guide member and positioned in different positions, said positions being determined by a plurality of recesses disposed along said guide member, wherein said guide member is in the form of a rail comprising a web section, mountable adjacent said carrier and defining said clearance. and flanges extending firstly away from the web section and away from said carrier and then turning inwards toward each other, said in-turned portions between them forming a longitudinal channel, said in-turned portions each provided with said recesses; said runner comprising both external parts outside the rail, internal parts essentially inside the rail and connecting means for operably connecting said external and internal parts; said connecting means extending through said longitudinal channel of said rail; said external parts including a sleeve runner, having a front portion and a back portion, enclosing entirely the rail, said back portion of said sleeve runner being positioned in said clearance between said rail and said carrier, said front portion of said sleeve runner provided with first means defining an aperture positioned such that said first aperture means may be placed above said recesses as of said rail; said internal parts include locking means, being arranged to enter simultaneously at least one of said recesses in each of said in-turned portions of said rail, for locking said runner in a predetermined position on said rail; and said connecting means includes movement means to move said locking means inward and outward to release and engage, respectively, said locking means from and with respectively, said recesses of said rail as well as said first aperture means of the sleeve runner positioned outside said rail;

and wherein said internal parts further comprise an interconnected member arranged within said channel of said rail, said interconnected member being rigidly connected to said front portion of said sleeve runner, said interconnected member having opposed edges extending, respectively, beneath said in-turned portions of said rail and said interconnected member is provided with second means defining an aperture, receivable of said locking means, aligned with said first means defining an aperture of said sleeve runner; and said connecting means comprises a shaft, having a first end and a second end, connected to said locking means at said first end and to a push button at said second end, said push button being manually engageable to move said shaft, said shaft slidably extending through a first hole in said front portion of said sleeve runner and a second hole in said interconnected member.

4,640,551

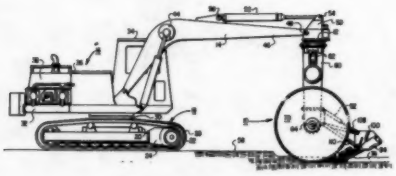
ROCK SAW UNIT FOR HARD ROCK EARTH FORMATIONS

Edward N. Marten, P.O. Box 183, Von Ormy, Tex. 79703

Continuation-in-part of Ser. No. 614,460, May 25, 1984, which is a continuation-in-part of Ser. No. 103,231, Dec. 13, 1979, Pat. No. 4,542,940, which is a continuation-in-part of Ser. No. 966,338, Dec. 4, 1978, Pat. No. 4,230,372. This application Sep. 23, 1985, Ser. No. 779,148

Int. Cl.[4] E21C *27/10*

U.S. Cl. 299—1 **14 Claims**



1. Rotary trenching apparatus comprising:

an off highway type vehicle operably movable over ground terrain;

an elongated boom extending from said vehicle and adjustable for varying the position setting of its distal end in relative orientation to the ground surface therat;

a support head on the distal end of said boom; and

a trenching unit mounted on said support head in a driving relation therewith, and comprising:

a. a pair of axially spaced cutting wheels mounted for rotation in said driving relation and having cutting teeth circumferentially spaced about its periphery;

b. a hydraulically powered breakout tool having a reciprocally actuated chisel face operable for chiseled breakup removal of earth formations encountered against said chisel face;

c. support means for supporting said breakout tool with the chisel face longitudinally spaced from said cutting wheels and in a plane located intervening within the spacing between said cutting wheels; and

d. adjustment means to position set the height of said chisel face relative to the cutting plane of said cutting wheels.

4,640,552

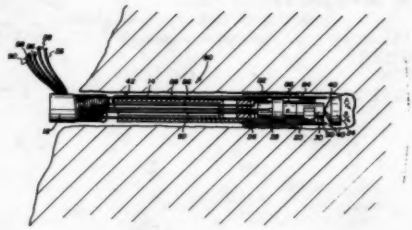
METHOD AND APPARATUS FOR SPLITTING ICE MASSES

Ronald D. Page, Newfoundland, Canada, assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 536,802, Sep. 28, 1983, abandoned. This application Oct. 16, 1985, Ser. No. 787,706

Int. Cl.[4] F02B *15/02*

U.S. Cl. 299—24 **5 Claims**



1. An apparatus for fracturing an ice structure comprising:

an elongated hollow housing having a deployment end and a drilling end;

a drillhead rotatably mounted on said drilling end of said housing;

a pressure means fixed to said drillhead for providing pressurized fluid from said drillhead to the ice structure to drill a borehole by fluid erosion including pressure jets mounted on said drillhead for receiving pressurized fluid;

a conduit means traversing through said housing means for providing pressurized fluid to said pressure jets;

a movement means for advancing said elongated housing into the ice structure to a predetermined location approximately one-third the distance from the bottom of the ice structure;

a packing means on said drilling end of said housing for sealing said housing in a portion of the borehole; and

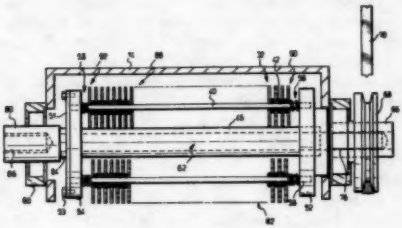
a force means for providing high pressure gas to said drilling end of said housing in said sealed portion of the borehole.

4,640,553

BRAKE SYSTEM FOR CUTTERS OF SURFACE CLEANING CUTTER CAGE

Frank Zelenka, Rexdale, Canada, assignor to Bartell Industries Ltd., Weston, Canada

Filed Jan. 31, 1985, Ser. No. 697,014
Int. Cl.[4] E01C *23/08, 23/12*
U.S. Cl. 299—39 18 Claims



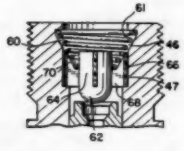
1. In an apparatus for removing surface material from a solid substrate comprising a support frame, a rotary cutter cage, means for mounting said rotary cutter cage on said support frame, means for rotating said rotary cutter cage, said rotary cutter cage having at least two spaced-apart plate portions to which at least one bar is connected, a plurality of cutters being mounted along each of said at least one bar to provide at least one row of said plurality of cutters, said cutters impacting a solid substrate during rotation of said cutter cage, each of said cutters having a bore through which said bar extends in mounting said plurality of cutters on said cutter cage, said bore being larger than said bar to permit rotation of each said cutter on said bar at least during contact with a surface being treated, said cutter cage having means for braking rotation of said cutter after each occurrence of a corresponding said row of said cutters contacting a surface being treated during rotation of said cutter cage, said brake means being provided for each of said at least one bar for frictionally engaging adjacent cutters and frictionally engaging end portions of said row of cutters with said respective plate portions, said brake means establishing a degree of frictional engagement between said cutters and said plate portions to permit said cutters to rotate during contact with a surface being treated and brake rotation of said cutters before said row of cutters contact such surface again said brake means comprising a compressible resilient material associated with each said row of cutters, the extent to which said material is compressed determining said degree of frictional engagement.

4,640,554

VALVE ASSEMBLY FOR USE IN BRAKE PRESSURE CONTROL UNIT

William A. Barr, Gibson Island, Md. 21056

Division of Ser. No. 659,897, Oct. 12, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 849,269
Int. Cl.[4] B60T *8/26*
U.S. Cl. 303—6 C 4 Claims



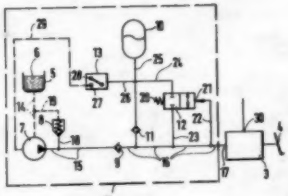
1. In a brake pressure control unit for a vehicle brake system which unit includes an inlet adapted to be connected to a master cylinder and an outlet adapted to be connected to a wheel brake cylinder, said unit having a stepped bore, a stepped piston in said bore and including an axial passage communicating with said inlet and said outlet, a valve chamber in said unit between one end of said stepped bore and said inlet, said chamber having a cylindrical internal wall surface, a valve seat co-axial with said passage in said stepped piston and at the end thereof adjacent said valve chamber, and a valve extending towards said bore from said chamber for engagement by said valve seat to close said passage upon movement of said stepped piston towards said valve in response to opposing pressure forces acting on said piston, said valve having a cross-sectional dimension less than said bore and said valve chamber, the invention comprising means for retaining said valve at all times co-axial with said valve seat and comprising a part integral with said valve and extending co-axially into said valve chamber, said integral part being radially spaced inwardly from the wall of said chamber, a cylindrical sleeve-like element having an inner surface surrounding said integral part and an outer surface whose diameter is complementary to and in sliding engagement with the inner surface of said valve chamber, and means integrally joining the inner surface of said sleeve-like element and said integral part, said sleeve-like element having an axial extent which in cooperation with the inner surface of said valve chamber prevents said assembly and hence said valve from moving laterally or cocking with respect to the axis of said valve seat, and axial passageway means between said valve and the outer surface of said sleeve-like element for connecting said inlet and said bore.

4,640,555

SYSTEM AND METHOD FOR SUPPLYING FLUID UNDER PRESSURE FOR A VEHICLE BRAKE SYSTEM

Hannes Bertling, Vaihingen, and Heinz Leiber, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,082
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435435; Mar. 26, 1985, 3510910
Int. Cl.[4] B60T *8/02, 13/14*
U.S. Cl. 303—10 15 Claims



1. A system for supplying fluid under pressure for a motor vehicle brake system, which comprises a pressure supply system, including a fluid supply, a pump and a pressure reservoir that is fillable with fluid by said pump, a brake control valve having an inlet connected to said pressure supply system for controlling braking pressures in at least one brake circuit for at least one wheel brake, a fluid control valve means in said pressure supply system between said pump and said pressure reservoir and connected to a line to said brake control valve, said fluid control means controlling fluid pressure with priority supplying of fluid under pressure to said brake control valve, a pressure control switch for controlling said pump to supply fluid under pressure to said brake control valve and to said pressure reservoir in order to fill said pressure reservoir to a predetermined pressure and to shut off said pump when said predetermined pressure has been reached in said pressure reservoir whereby said pressure reservoir supplies fluid under

pressure to said brake control valve until a predetermined low pressure has been reached wherein said pressure control switch starts said pump.

4,640,556

LOAD-DEPENDENT BRAKE PRESSURE REGULATOR FOR MOTOR VEHICLE AND/OR TRAILER BRAKE SYSTEMS

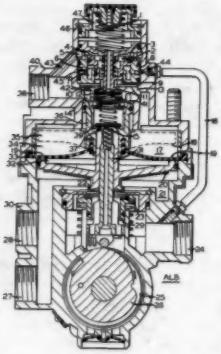
Gerhard Fauck, Hanover; Bernd Kiel, Wunstorf, and Helmut Ulrich, Springe, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,417

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1983, 3344839

Int. Cl.[4] B60T *8/22*

U.S. Cl. 303—22 R **18 Claims**



1. A load-dependent air brake pressure system for pneumatically activated motor vehicles and/or trailer brakes comprising,

(a) a load-dependent brake pressure controller which is regulated by control pressure modulated by a brake valve;

(b) an entrance device for controlling the load-dependent brake pressure controller up to a predetermined control pressure for delivering the full control pressure as a function of the controlled pressure;

(c) means for increasing the controlled pressure in accordance with a value corresponding to the control ratio up to full available supply pressure; and

(d) means for effectively controlling said means for increasing the controlled pressure when a predetermined control pressure is exceeded.

4,640,557

ANTI-SKID DEVICE FOR MOTOR VEHICLES

Ettore Panizza, and Ercole Premoli, both of Turin, Italy, assignors to Fiat Auto S.p.A., Italy

Filed Jun. 13, 1985, Ser. No. 744,455

Claims priority, application Italy, Jun. 15, 1984, 67621 A/84

Int. Cl.[4] B60T *8/58*

U.S. Cl. 303—100 **4 Claims**

1. An anti-skid device for a front-wheel drive motor vehicle with a front-mounted engine and fitted with a hydraulic braking system comprising a master cylinder actuated by a brake pedal and connected to a first and a second hydraulic circuit each connected to brake operating cylinders of a respective pair of diagonally opposed front and rear wheels of the motor vehicle, the said device comprising:

electrical position sensor means associated with the brake pedal;

sensor means for sensing the average speed of the front wheels;

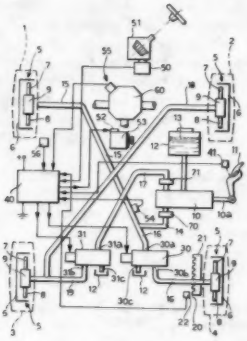
angular speed sensor means designed to supply electrical signals indicative of the speed of rotation of at least one rear wheel of the motor vehicle;

sensor means for sensing the speed of rotation of the engine,

an electrical sensor for sensing the steering angle of the wheels of the motor vehicle,

a first and a second electrically-controlled changeover valve designed to be fitted respectively in the first and the second hydraulic circuits between the master cylinder and the brake operating cylinder of the rear wheel, each changeover valve being designed, when it receives a command signal, to changeover from a first condition in which it permits braking of at least one of said front and rear wheels with which it is respectively associated to a second condition in which it causes at least partial reduction of the braking force of at least one of said front and rear wheels with which it is associated; and

an electronic control unit connected to the said angular speed sensor means, to said average speed sensor means, to



said engine speed sensor means, to the position sensor means, to the said electrically controlled changeover valves and to the said steering sensor and arranged:

(a) to supply said command signal to the first changeover valve, during braking, to reduce the braking force of the said at least one rear wheel associated with the said first valve when the signals supplied by the said position sensor means and the said angular speed sensor means respectively indicate that the brake pedal is depressed and the said at least one rear wheel of the motor vehicle is on the point of locking; and

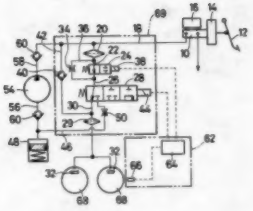
(b) to supply said command signal to the second changeover valve to reduce the braking force of the front and rear wheels associated with the said second valve when, during said braking, the signals supplied by the said average speed sensor means and the steering sensor means respectively indicate that at least one front wheel is locked and that the steering angle has increased beyond a predetermined extent relative to a value assumed by the said steering angle at the instant when the said at least one rear wheel locked.

4,640,558

ANTI-SKID BRAKE SYSTEM

Yoshihisa Nomura, Toyota; Hiroyuki Oka, Susono, and Hiromi Otsuki, Anjyo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippondenso Co., Ltd., both of, Japan

Filed Jul. 27, 1984, Ser. No. 635,229
Claims priority, application Japan, Jul. 29, 1983, 58-140391
Int. Cl.[4] B60T *8/36, 13/68*
U.S. Cl. 303—119 **14 Claims**



1. An anti-skid brake system for a vehicle, comprising:
- a master cylinder generating a hydraulic braking pressure in response to operation of a brake operating member of the vehicle;
- at least one brake cylinder for applying a brake to a wheel of the vehicle;
- a primary fluid passage for connecting said at least one brake cylinder and said master cylinder;
- a reservoir for storing a brake fluid;
- a solenoid-operated directional control valve disposed in said primary fluid passage and operable selectively in a first position for providing communication of said at least one brake cylinder with said master cylinder, a second position for providing communication of said at least one brake cylinder with said reservoir, and a third position for inhibiting communication of said at least one brake cylinder with said master cylinder and said reservoir;
- a control device sensing a skidding condition of said wheel and controlling said directional control valve according to the sensed skidding condition of the wheel;
- a restrictor disposed in said primary fluid passage in series connection with said directional control valve; and
- a solenoid-operated shut-off valve disposed in said primary fluid passage in parallel connection with said restrictor and controlled by said control device, said shut-off valve being normally placed in an open position thereof, and brought into a closed position thereof at the time when said control device has started to activate said directional control valve for preventing said wheel from skidding.

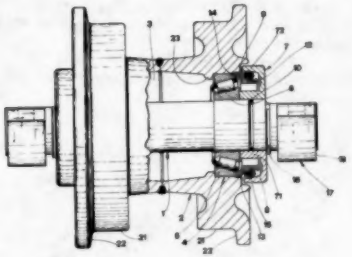
4,640,559

BEARING SEAL FOR ENDLESS TRACK ROLLERS

Aldo Crotti, Castelnuovo Rangone, Italy, assignor to Italtractor Meccanica ITM S.p.A., Potenza, Italy

Filed Dec. 3, 1984, Ser. No. 677,305
Int. Cl.[4] B62D *55/14*
U.S. Cl. 305—11 **3 Claims**

1. An improved roller for the tracks of crawler tractors and other similar vehicles, comprising:
- a shaft fixed immovably to a crawler vehicle and including opposing end portions;
- a roller body having portions adjacent each of said shaft end portions and being supported by said shaft for rotation about the longitudinal axis of said shaft, said roller body having a recess at each end of said portions;
- a chamber defined between said roller body and said shaft for containing lubricant;
- a pair of bearings each secured in each of said recesses, each said bearing including an inner race engaging with said shaft and an outer race engaging with said roller body;
- a pair of thrust brackets, each secured on said shaft adjacent respective end portions thereof, said thrust brackets cooperating to maintain said roller body at a predetermined position on said shaft; and
- means, cooperating with said bearings and said thrust brackets, for preventing leakage of said lubricant from within said chamber through said bearings, each said preventing means being positioned at a portion of said roller body adjacent a respective shaft end portion and comprising annular sealing means and annular thrust means,



said annular sealing means consisting solely of a metal ring supported, coaxially about said shaft at said roller body portion between said respective thrust bracket and said respective bearing, for movement in a direction axially of said shaft, said ring having a radially extensive surface engageable with a radially extensive surface of said bearing outer race, and

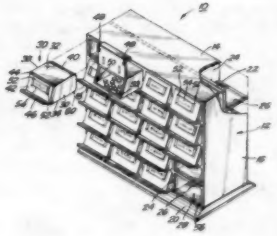
said annular thrust means consisting solely of an elastomeric ring in direct engagement with, and compressed between, an inner surface of said thrust bracket and an outer surface of said metal ring.

4,640,560

PILL DISPENSER

Richard S. Blum, 25 Spruce Dr., East Hills, N.Y. 11576

Filed Dec. 17, 1984, Ser. No. 682,658
Int. Cl.[4] G08B *21/00*
U.S. Cl. 312—234.1 **14 Claims**



1. A pill dispenser for dispensing daily medications prestored for a week comprising:
- an upright housing having a plurality of compartments arranged in rows and columns, each column representing a day of the week and each row representing an hourly part of the day;
- a corresponding plurality of pill boxes, each slidably receivable within a respective compartment, each pill box respectively comprising an enclosed container having a hinged cover and storing all the medications to be taken at a pre-set hour and day;
- means for retaining said pill boxes in their respective compartments;

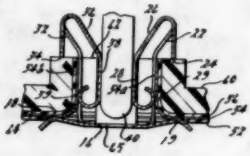
clock means for pre-setting a day and hour for each pill box;
indicator means associated with each pill box and coupled to said clock means whereby the indicator means on a respective pill box will give an appropriate indication when the time and day pre-set for that pill box occurs;
circuit means for retaining the indication until the pill box has been removed, and means to turn off the indicator means after the pill box has been removed.

4,640,561

FLEXIBLE PRINTED CIRCUIT CONNECTOR

Melvin J. George, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1985, Ser. No. 798,549
Int. Cl.⁴ H01R 9/09
U.S. Cl. 339—17 F **7 Claims**



1. A unitary retainer socket for providing a positive mechanical and electrical interconnection between a male pin conductor and a flexible printed circuit having exposed conductors while inserted in a walled aperture of a rigid support panel of a predetermined depth, comprising:
a generally planar base portion;
two pair of opposing legs extending in a generally normal direction from said base portion wherein the legs of each pair are separated by a defined contact space;
a pair of spring tabs extending from said base to provide resilient biasing of said socket against said flexible printed circuit when inserted in said panel aperture;
a retrorse locking tab extending from between each leg pair towards a corresponding spring tab;
an inner contact guide extending from each leg pair in a direction back towards said base portion forming continuous opposed surfaces separated by a distance that is less than the thickness of said male pin conductor for receiving and contacting said male pin conductor; and
an electrical contact extending outwardly from each of said inner contact guides and being compressible by the insertion of said male pin conductor between said inner contact guides to positively compress the exposed conductors of said flexible printed circuit against opposing walls of said panel aperture.

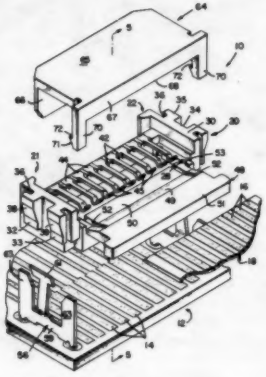
4,640,562

SURFACE MOUNTING MEANS FOR PRINTED CIRCUIT BOARD

John R. Shoemaker, Reidsville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 683,538, Dec. 19, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 828,576
Int. Cl.⁴ H01R 9/07
U.S. Cl. 339—17 F **21 Claims**

1. An electrical assembly including an electrical connector which is adapted to be mounted to the surface of a printed circuit board for interconnecting a plurality of conductors on the circuit board to a like number of conductors in a flexible flat cable, and comprising
an electrical connector comprising a body member having opposite end portions and a generally flat shelf extending longitudinally between said end portions, a plurality of metal terminals, with each of said terminals having a generally U-shaped configuration so as to define a pair of generally parallel legs, means mounting said terminals to said body member in a longitudinally spaced apart and aligned arrangement, and with a first one of the legs of each terminal extending laterally across at least a portion of said shelf and so that the first legs of the terminals define an upper row of longitudinally spaced apart legs which overlie said shelf, and with the second ones of the legs of the terminals defining a lower row of longitudinally spaced apart legs which is disposed below said shelf and so as to be exposed below said housing, and a wedge plate sized to overlie substantially the entire longitudinal and lateral dimensions of said shelf, and with the wedge plate being adapted to be laterally inserted between said shelf and said upper row of legs, and



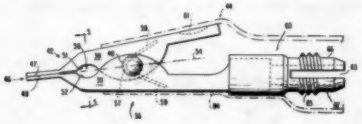
means for mounting said connector to a printed circuit board or the like,
whereby a flexible flat cable comprising a row of conductors may be electrically connected to said connector by the steps of exposing the conductors of the cable at an end portion thereof, and laterally inserting such end portion and the wedge plate between the shelf and the upper row of contact legs and so that the terminal legs of said upper row egage respective ones of the conductors of the cable, and wherein the connector and assembled cable may be mounted on a circuit board having a row of conductors on the surface thereof and with such conductors on the board being respectively engaged by the lower row of terminal legs.

4,640,563

UNIVERSAL CLASP STRUCTURE FOR EXTERNAL ELECTRODE PROBES

James R. LeBlanc, Augusta, Ga., assignor to The LeBlanc Corporation, Augusta, Ga.

Filed Jun. 10, 1985, Ser. No. 743,147
Int. Cl.⁴ H01R 11/00
U.S. Cl. 339—32 M **10 Claims**



1. Universal clasp structure capable of being releasably secured to either a planar tab-type or curvilinear-surface button-type contact of an EKG external electrode sensor for electrical transfer of body or skin signals enabling accurate

measurements to be made with minimal electrical interference, comprising:

a pair of elongated electrically-conductive clip arms,

each clip arm having electrical contact means contiguous to one of its longitudinal ends and means capable of functioning as a handle at its remaining longitudinal end,

mechanical means pivotally interconnecting said pair of clip arms intermediate their longitudinal ends in articulated relationship, with said electrical contact means at said one longitudinal end of each clip arm confronting each other and said handle means at the remaining longitudinal end of said clip arms being disposed for articulated movement toward each other about said mechanical interconnecting means to open said confronting contact means,

spring means acting on said clip arms as pivotally interconnected to bias said confronting electrical contact means of said clip arms together,

said electrical contact means on each said clip arm including:

a planar surface contact, and

a curvilinear configuration contact,

said planar surface contact extending from the distal end of each said clip arm toward said mechanical interconnecting pivot means for said arms presenting an elongated nose portion of substantially flat configuration in longitudinal cross section,

said curvilinear contact of each clip arm being located intermediate said planar surface contact and said interconnecting means, and

electrical coupling means located at said handle end of at least one of said clip arms for electrically connecting said clasp structure directly to a shielded electrically conductive cable for transferring sensed electrical signals to electrical measurement equipment.

4,640,564

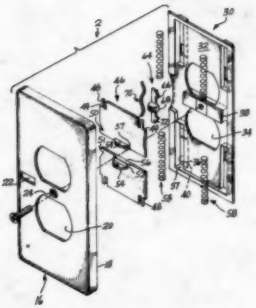
ELECTRICAL OUTLET FACEPLATE WITH LOCKING CLOSURES

Joe W. Hill, 23320 SE. 271st, Maple Valley, Wash. 98038

Filed Mar. 4, 1986, Ser. No. 835,999

Int. Cl.[4] H01R *13/44*

U.S. Cl. 339—40 **11 Claims**



1. A faceplate for an electrical outlet of the type having at least one set of openings for receiving prongs of an electrical plug, said faceplate comprising:

a body dimensioned to cover the outlet and having an aperture therein alignable with said openings to allow insertion of said prongs into said openings;

a shutter having a closed position in which it blocks said aperture and an open position in which it is adjacent to said aperture; said shutter including an edge portion with an interlocking surface;

spring means for biasing the shutter into its closed position;

tab means carried by the shutter for manually sliding the shutter from its closed position into its open position against the force of the spring means; and

releasable lock means for preventing the shutter from sliding out of its closed position toward its open position; said lock means including an interlocking portion, resilient means for urging said interlocking portion toward the shutter and into interlocking engagement with said interlocking surface of the shutter to positively lock the shutter against sliding out of its closed position toward its open position, and a release member carried by said interlocking portion for manually sliding said interlocking portion against the force of the resilient means away from the shutter and out of engagement with said interlocking surface to allow the tab means to be operated to slide the shutter into its open position.

4,640,565

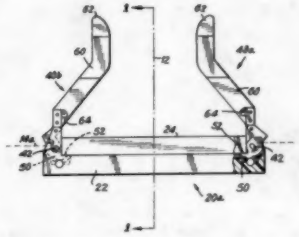
EJECTING LATCH FOR ELECTRICAL CONNECTORS

Alexander W. Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1985, Ser. No. 739,032

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—45 M **9 Claims**



1. Electrical connector apparatus comprising:

a connector member having (1) a substantially rectangular first connector face, (2) first and second substantially planar, substantially parallel side surfaces perpendicualr to the first connector face, each of the first and second side surfaces extending rearwardly from respective first and second substantially parallel sides of the first connector face, and (3) at least one ejection surface substantially parallel and adjacent to the first connector face and facing in substantially the same direction as the first connector face;

a header member having a second rectangular connector face for removably receiving the connector member along a connector axis which is mutually perpendicular to the first and second connector faces for making a plurality of electrical connections between the header member and the received connector member; and

an ejecting latch pivotally mounted on the header member adjacent the second connector face, the pivotal axis of the latch being substantially perpendicular to the first and second side surfaces of the received connector member, the latch having (1) a first lever arm extending substantially perpendicularly from the pivotal axis, said first lever arm having an ejection element bearing on the ejection surface of the received connector member, and (2) a second lever arm offset and projecting from the first lever arm, said second arm extending adjacent and angularly across one of said side surfaces of the received connector member in a direction toward the rear of said connector member, said second lever arm terminating with an end portion which is located beyond the rear of the received connector member so that the latch can be pivoted by engaging the end portion, thereby causing the first lever arm to push the ejection surface and the received connector member away from the header member said second

lever arm is its ejecting position extending substantially perpendicular to said first connector face, whereby obstruction from an adjacent connector is avoided.

4,640,566

ELECTRICAL CONNECTOR HOUSING

Yoshihide Matsusaka, Kawasaki, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

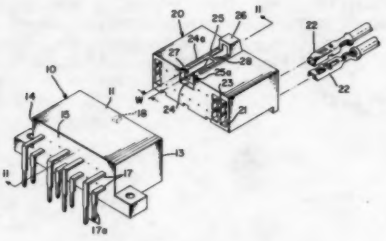
PCT No. PCT/US85/00696, § 371 Date Nov. 12, 1985, § 102(e) Date Nov. 12, 1985, PCT Pub. No. WO85/05501, PCT Pub. Date Dec. 5, 1985

PCT Filed Apr. 17, 1985, Ser. No. 797,282

Claims priority, application Japan, May 17, 1984, 59-71100[U]

Int. Cl.⁴ H01R *13/627*

U.S. Cl. 339—91 R **4 Claims**



1. An electrical connector housing, comprising:

a male housing portion;

a female housing portion which is matable with male housing portion, characterized in that:

the male housing portion has a latching arm on which a latching portion is provided, with the latching arm lying within a groove formed in an outer wall of the male housing portion and one end thereof being fixed so as to resiliently flex toward the bottom surface of the groove, the female housing portion further having a locking member which is engageable with the latching projection of the latching arm so as to lock both housings with each other when the male housing portion is mated with the female housing portion, further characterized in that:

the latching arm is provided with a groove which extends in the longitudinal direction of the latching arm and which has the latching projection therein.

4,640,567

DETACHABLE SEALED MULTICONTACT ELECTRICAL CONNECTOR

Robert G. Lundergan, Kernersville, N.C., and Donald W. McClune, Winston-Salem, N.J., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 696,286, Jan. 30, 1985, abandoned. This application Apr. 16, 1986, Ser. No. 854,719

Int. Cl.⁴ H01R *4/00*

U.S. Cl. 339—94 M **10 Claims**

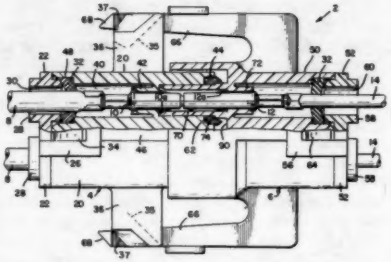
1. A multicontact detachable sealed electrical connector for use in establishing a sealed interconnection between conductors in one or more circuits, comprising;

first and second mating connector housings formed of an insulative material, each having cavities extending from an exterior housing end therethrough to an interior housing end, each cavity having retaining means therein for attaching a corresponding terminal insertable therein to the housing,

an outer seal aligned with each housing cavity at the exterior end of the housing, to establish sealing integrity between each conductor and the corresponding connector housing;

tubular protuberances on the interior end of the first connector housing defining an extension of each cavity therein, each tubular protuberance being insertable in the corresponding cavity adjacent the interior end of the second connector housing; and

a deflectable inner seal surrounding each tubular protuberance, means maintaining said inner seal in position on each protuberance spaced from an interior end of said first connector housing, the inner seal having an outer dimension greater than the inner diameter of the cavity in the second housing, the inner seal having inner and outer peripheral surfaces and inner and outer facial surfaces, the outer peripheral surface being axially deflected toward said interior end, when the first and second connector housings are mated, whereby terminals interconnecting corresponding conductors forming each circuit are separately sealed.



4,640,568

ELECTRIC CABLE CONNECTOR HANDLE

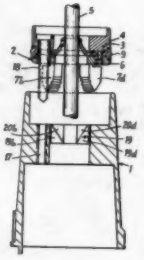
Yves L. Magourou, Ermont, France, assignor to Societe de Exploitation des Procedes Marechal, Paris, France

Filed Jan. 8, 1985, Ser. No. 689,791

Claims priority, application European Pat. Off., Sep. 24, 1984, 84401902.6

Int. Cl.⁴ H01R *13/58*

U.S. Cl. 339—103 R **18 Claims**



1. Electric cable connector handle for securing and providing electrical contact for a cable which enters one end of said connector handle, said connector handle comprising:

(a) a gripping element comprising an annular base provided with a plurality of elastically deformable jaws which project from the annular base and cooperate with at least one frustoconic bearing, said gripping element being positioned in the connector handle in a manner such that at least the exterior portions of the ends of said jaws converge opposite to the annular base and are disposed on the side of the base opposite to the inlet of the cable into the connector handle, and wherein said frustoconic bearing

converges towards the longitudinal axis thereof on the opposite side of the base relative to the inlet of the cable;

(b) means for exerting a pressure on the annular base to immobilize it in the connector handle and cause an axial displacement of the base and of the jaws into said frustoconic bearing to cause said jaws to grip said cable, wherein said jaws are inwardly and elastically deformable, wherein when said annular base is moved along said longitudinal axis of said bearing, at least the ends said jaws are deformed into a position in which at least said jaw ends grip said cable;

(c) a seal between the annular base and a cover; and

(d) means for fixedly connecting said cover, said seal and said annular base to one another.

4,640,569

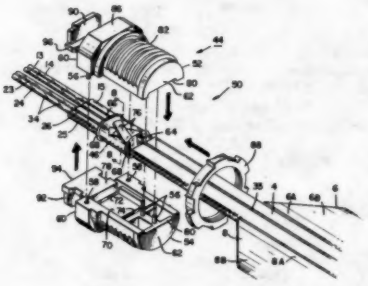
ADAPTOR FOR COUPLING A CABLE TO A CONNECTOR

Frank P. Dola, Hudson; Paul P. Siwinski, Seminole, and Grover A. Zwieg, Clearwater, all of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 27, 1985, Ser. No. 716,779

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—143 R **21 Claims**



1. For use in joining a plurality of conductive wires of a cable to a connector, an adaptor comprising:

a generally cylindrically shaped, hollow, ferrule through which the insulated wires of a cable may pass,

an electrically conductive adaptor body formed of separable portions shaped for mating engagement one with another, each portion having an internal recess for the receipt of said ferrule therein, and comprising means for providing electrically grounded contact with ground strips of the cable, the adaptor including coupler plates on the outboard ends of said separable portions for the securement and grounding of the adaptor to a connector, and

securement means to hold said portions of said body in operative engagement of said ferrule located within said recesses of the adaptor body.

4,640,570

ELECTRICAL CONE CONNECTOR

Edward A. Strate, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 9, 1985, Ser. No. 785,690

Int. Cl.[4] H01R *13/50*

U.S. Cl. 339—182 R **4 Claims**

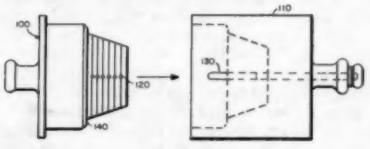
1. An electrical connector for connecting a first set of wires with a second set of wires, said electrical connector comprising:

a male plug which has a center and receives said first set of wires in a plurality of sockets on one end, and has a conically shaped mating surface on its other end, said male plug having an outer surface with a longitudinal indentation;

a female socket which has a center and receives said second set of wires in a plurality of sockets on a projecting annular surface at one end, and has a concave conical surface on its other end with interior dimensions complementary to the conically shaped mating surface of the male plug;

a first set of contacts distributed radially and longitudinally in a plurality of annular layers in the conically shaped mating surface of the male plug, each of said first set of sockets being connected to one of said first set of wires inserted in the plurality of sockets in the male plug, said first set of sockets having first engagement surfaces imbedded in the conically shaped mating surface of the male plugs, said first set of contacts comprising a plurality of screw contacts which receive and are connected to the first set of wires as they enter the sockets in the male plug, the screw contacts in the male plug each having a first outer contact which extends onto the conically shaped mating surface of the male plug and a first screw contact which extends through the first outer contact into the male plug to contact one of the first set of wires;

a second set of contacts distributed radially and longitudinally in a plurality of annular layers in the concave conical surface of the female socket, each of said second set of contacts being connected to one of said second set of wires inserted in the plurality of sockets in the female socket, and having second engagement surfaces imbedded in the concave conical surface of the female socket to electrically connect with one of the first set of sockets when the male plug and female socket are engaged, said second set of contacts comprising a plurality of screw



contacts which receive and are connected to the second set of wires as they enter the sockets in the female socket, the screw contacts in the female plug each having a second outer contact on the concave conical surface of the female socket serving as the second engagement surface and a second screw contact which extends through the second outer contact into the female socket to contact with one of second set of wires;

an insert attached to the male plug at an orifice within its conically shaped mating surface, at its center;

a self locking center bolt having a threaded end and a head, said threaded end projecting through an orifice in the female socket to be screwed into the insert at the center of the male plug when the male plug and female socket are engaged, the head of the self locking center bolt remaining outside of the orifice at the end of the female socket which receives the second set of wires and pressing the female socket towards the male plug when the threaded end of the self locking center bolt is screwed into the insert, the self locking center bolt and insert thereby providing early engagement and preventing the first and second set of contacts from prematurely touching each other during assembly; and

an indexing key fitting between a section of an outer edge of the male plug and a section of the female socket, said indexing key providing annular alignment between all the first and second set of contacts by aligning the male plug with the female socket; said indexing key being a protrusion connected to and aligned longitudinally along the projecting annular surface of the female socket so that it is parallel with the self locking center bolt, said protrusion fitting into the longitudinal indentation in the male plug

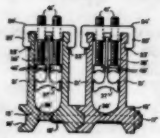
when the male plug is engaged with the female socket to annularly align the first and second set of contacts so that they contact each other in corresponding pairs when the male plug and female socket are engaged.

4,640,571

ELECTRICAL CONNECTOR BLOCKS

Gerard S. Walter, Glenshaw, and John Hagan, Gibsonia, both of Pa., assignors to Walter Electrical Manufacturing Company, Pittsburgh, Pa.

Filed Jan. 14, 1985, Ser. No. 691,502
Int. Cl.[4] H01R 13/11
U.S. Cl. 339—242 8 Claims



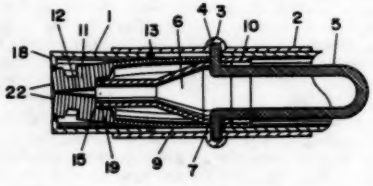
1. An electrical connector block comprising a housing having a pair of generally parallel elongate sidewalls extending from a base member and separated by a trough open on the side opposite the base member, said trough extending from a first end of said base member to a second end thereof, a groove on each sidewall opposite the trough and spaced from the open side of the trough, a cap member having depending arms along each side edge adapted to slide along the outer sides of the parallel sidewalls over the open trough, said arms having inturned flanges engaged in the grooves of the sidewall, at least one depending member on said cap member extending between the sidewalls of the base member, at least one screw member threadingly engaged in said cap member through said at least one depending member and carrying a clamp member pivoted on the end thereof between the sidewalls for clamping a wire between the clamp member and base member, said base member having a V-groove extending generally parallel to the trough bottom along one side of said base member from said first end to said second end and a like shaped fully interfitting V-tongue parallel thereto on the other side of said base member and passages through the base transverse to the tongue and groove and passing therethrough receiving a fastener means whereby a plurality of connectors may be conductively and integrally connected together.

4,640,572

CONNECTOR FOR STRUCTURAL SYSTEMS

Thomas R. Conlon, P.O. Box 88810, Honolulu, Hi. 96815

Filed Aug. 10, 1984, Ser. No. 640,044
Int. Cl.[4] H01R 11/22
U.S. Cl. 339—252 R 14 Claims



1. In a structural system including an attaching component provided with at least one connecting port, a structural component, and a coupling mechanism adapted to attach said structural component to said connecting port of said attaching component; an improved coupling mechanism comprising:

an elongated jaw assembly disposed coaxially within said structural component proximate an end thereof and movable between an extended and a retracted position, said jaw assembly including a plurality of radially expansible jaws adapted to engage an inner perimeter of said connecting port when they are extended out of said end of said structural component to said extended position;

an elongated locking pin disposed coaxially within said jaw assembly, said locking pin being movable between a locked and unlocked position, where moving said locking pin from said unlocked position to said locked position causes said jaw assembly to move from said retracted to said extended position, and where moving said locking pin from said locked position to said unlocked position causes said jaw assembly to move from said extended position to said retracted position;

an operating sleeve disposed around said end of said structural component; and

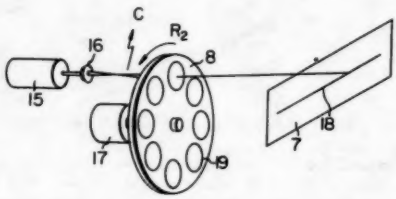
means connecting said operating sleeve to said locking pin such that movement of said operating sleeve causes a corresponding movement of said locking pin.

4,640,573

LENS-ON-DISC TYPE OPTICAL SCANNING APPARATUS

Keiji Katsoka, Kawagoe, and Susumu Saito, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,804
Claims priority, application Japan, Feb. 24, 1982, 57-27491
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—6.1 7 Claims



1. A lens-on-disc type optical scanner comprising a first support in the form of a disc, a plurality of lenses arranged on said first disc along the circumferential direction of said disc and having a first predetermined surface profile, a second support in the form of a disc, and a plurality of lenses arranged on said second disc along the circumferential direction of said disc and having a second predetermined surface profile different from said first predetermined surface profile, said first and second discs being bonded together at their circumferential edges, wherein a scanning plane located at a predetermined position is scanned by a laser beam passing through said lenses sequentially by rotating said first and second discs.

4,640,574

INTEGRATED, MICRO-OPTICAL DEVICE

Hans-Georg Unger, Braunschweig, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 525,887
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231492
Int. Cl.[4] G02B 6/12
U.S. Cl. 350—96.11 9 Claims

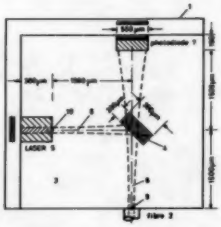
1. An integrated, micro-optical device for use in combina-

tion with a monomode fiber, a laser and a photodiode, said device comprising:

a common substrate including means for connecting the fiber, laser and photodiode to said device;

a film waveguide disposed on said substrate and presenting a first beam path between said means for connecting the fiber and said means for connecting the photodiode;

a refraction grating disposed in the first beam path of said film waveguide, said film waveguide presenting a second



beam path between said means for connecting the laser and said refraction grating;

wherein said refraction grating is composed of parallel lines which are arranged in confocal elliptical arcs and which are so spaced apart to define a selective filter which transmits radiation coming from the fiber and having a first wavelength toward the photodiode, and deflects radiation coming from the laser and having a second wavelength different from the first wavelength in the direction toward the fiber.

4,640,575

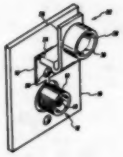
FIBER OPTIC CONNECTOR COVER APPARATUS

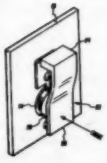
Theodore A. Dumas, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 13, 1986, Ser. No. 818,517

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.20 **4 Claims**





1. Combination dust cover and radiation shield comprising, in combination:

L-shaped base means including mounting means for attaching said base means to a support adjacent a cylindrical male lightwave connector means, said male connector means including at least one annular surface engaging means; and

unitary L-shaped flexible shield means including first attachment means for connection to said base means at one end thereof and a cylindrical and tubular female second attachment means, having at least one interior annular surface, at the other end thereof for engagement with the male lightwave connector means, said shield means having a normal position wherein the female second attachment means covers the male lightwave connector means, said shield means also having an elastic memory so that it may be flexed out of its normal position of covering the lightwave connector means whereby a female lightwave connector may be attached to the male lightwave connector means and said shield means will return to said normal position, the application of force in line with an axis of said lightwave connector means and to said other end of said flexible shield means causing said annular surface of said shield means to interact with said male lightwave connector means to form a dust cover for said male lightwave connector means.

4,640,576

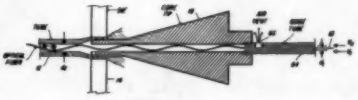
METHOD AND APPARATUS FOR TUBING OPTICAL FIBERS

H. Keith Eastwood, Winnipeg, and Paul W. J. Rivett, Scarborough, both of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed Jun. 26, 1984, Ser. No. 624,825

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **10 Claims**



3. A system for controlling the feed of at least one optical fiber into a tube while the tube is being formed, said system comprising:

(a) means for propelling at least one fiber into a tube with sufficient force to move the fiber faster than the speed at which the tube is being formed;

(b) means for restraining the feed of fiber into the tube;

(c) means for driving the tube being formed at a predetermined speed; and

(d) means for regulating the excess length of the fiber by controlling the degree of restraint imparted to said fiber by said restraining means based upon the driven speed of the tube by the means driving the tube so that the feed of fiber into the tube is faster than the speed at which the tube is being formed by a predetermined controlled amount.

4,640,577

IMAGE FIBER WITH A MECHANISM FOR ROTATING A FIELD OF VIEW

Koichi Tsuno, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 503,475, Jun. 13, 1983, abandoned. This application Mar. 19, 1985, Ser. No. 767,069

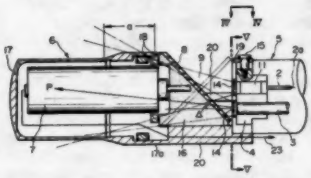
Claims priority, application Japan, Jun. 11, 1982, 57-100349

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—96.25 **10 Claims**

1. An image fiber device of the type having a mechanism for rotating a field of view, said image fiber device comprising; a main portion, having an image fiber and a light guide parallel to said image fiber, and an adaptor mechanism detachably mounted to the end of said main portion for rotating a field of view of said image fiber device, said adaptor including a window, a motor with a rotary shaft substantially parallel to the axis of said image fiber, a mirror having a reflecting surface for

reflecting an illuminating light from said light guide through said window to an object to be viewed and for receiving an image of said object through said window and reflecting said image to said image fiber, said mirror being mounted on said rotary shaft and having its reflecting surface opposite the ends



of said image fiber and light guide and opposite said window, the axis of said rotary shaft being coincident with the axis of said image fiber, and said window being opened and formed in a side surface of said adaptor mechanism, at a position adjacent to said reflecting surface of said mirror.

4,640,578

OPTICAL INSPECTION DEVICE FOR INSPECTING AN ARTICLE SURFACE

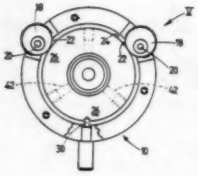
Charles F. R. Turner, Hingham, and John V. Wingfield, Bishop's Stortford, both of England, assignors to Prior Scientific Instruments Limited, Hertfordshire, England

Filed Mar. 20, 1985, Ser. No. 713,880

Claims priority, application United Kingdom, Mar. 20, 1985, 8407197

Int. Cl.⁴ G02B *27/02, 7/00*

U.S. Cl. 350—239 **3 Claims**



1. A hand-held optical inspection device comprising a magnifying lens arrangement, a casing enclosing said lens arrangement, said casing having two end regions, viewing means disposed at one of said end regions of the casing, and, at the opposite end region, adapter means capable of receiving in an adjustable manner a portion of an article upon which is the surface to be viewed, wherein the adapter means is capable of imparting controlled lateral movement of the surface with respect to the longitudinal axis of the lens arrangement in the focussing plane thereof, said adapter means including a centering ring in which an adapter component is received, and wherein the arrangement for imparting said controlled lateral movement comprises at least two cam surfaces arranged to impart pressure in a generally radially inward direction on spaced-apart regions of the perimeter of the ring, and spring-biassed reaction means for supporting the ring in the device.

4,640,579

SLIDING FRICTION MEMBER FOR LENS SLIDING RING

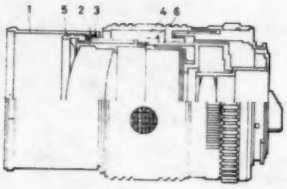
Morio Takizawa, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,349

Claims priority, application Japan, Feb. 10, 1983, 58-18373; Mar. 2, 1983, 58-30119

Int. Cl.⁴ G02B *15/00, 7/04*

U.S. Cl. 350—255 **8 Claims**



8. In a photographing lens device having first and second cylindrical members with said first cylindrical member being slidably fitted within said second cylindrical member, the improvement comprising: a sliding friction member provided between an outer surface of said first cylindrical member and an inner surface of said second cylindrical member, said sliding friction member comprising a corrugated elastic member bent into an annular shape and fitted into a groove in said second cylindrical member, said elastic member being flocked on a side thereof in contact with said outer surface of said first cylindrical member.

4,640,580

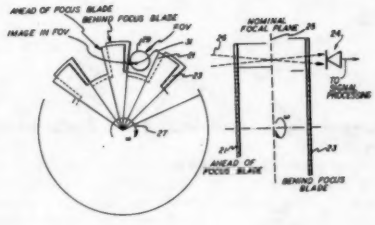
OPTICAL CHOPPER WITH HIGH RATE OF FOCUS DITHER

Eugene R. Schlesinger, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 345,860, Feb. 4, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,459

Int. Cl.⁴ G02B *26/02*

U.S. Cl. 350—274 **6 Claims**



1. In an optical system with an optical axis in which an image

is to be focused at an image plane, an improved chopper which can be driven at a high rate and use multi-notch choppers for obtaining dither about the focal point in said system comprising, first and second chopper blades, each having at least one notch in their periphery, said notches in said first and second chopper blades being fixed in rotationally offset position with respect to each other, said chopper blades mounted to a common shaft adapted for rotation, said blades disposed parallel to each other and essentially perpendicular to the optical axis, said blades disposed on opposite sides of the image plane, one of said blades providing an ahead of focus edge response and the other of said blades a behind focus edge response, means for sensing said ahead of focus edge response and a behind focus edge response and providing an output respresentative of the out of focus condition of said image at said image plane.

4,640,581

FLEXIBLE PRINTED CIRCUIT BOARD FOR A DISPLAY DEVICE

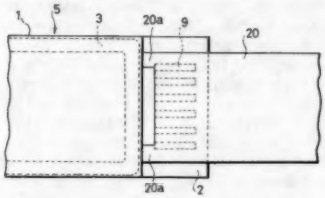
Jun Nakanowatari, Miyagi; Mitsuo Machida, Fukuoka; Toshiyuki Okamoto, and Yoshihiro Nakura, both of Iwaki, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 27, 1984, Ser. No. 686,706

Claims priority, application Japan, Dec. 28, 1983, 58-204060[U]

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—331 R **3 Claims**



1. In a flexible printed circuit board having one end soldered to the terminal section of a display device which is used for connection to an external circuit, the display device having a small base sheet and a large base sheet bonded together to form a cell,

the improvement wherein said end is provided with protrusions which, when caused to bear on the side of the cell of the display device, form a given gap between the portion of said end other than the protrusions and the small base sheet of the display device.

4,640,582

SYSTEM FOR DRIVING A LIQUID CRYSTAL MATRIX DISPLAY SO AS TO AVOID CROSSTALK

Kikuo Oguchi, and Yoshiro Uchikawa, both of Suwa, Japan, assignors to Kabushiki Kaisha Seiko Epson, Japan

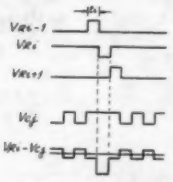
Filed May 7, 1984, Ser. No. 607,482

Claims priority, application Japan, May 10, 1983, 58-81129

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—333 **7 Claims**

1. A method for driving a liquid crystal matrix display device, said display having a plurality of scanning signal row electrodes and a plurality of image signal column electrodes, said row electrodes and column electrodes being provided in a matrix orientation, the intersection of each row and column defining a picture element, or pixel, the scanning of all of said pixels defining a frame, the method for driving said liquid crystal matrix display device comprising sequentially selecting each scanning signal row electrode once per frame and selecting each image signal column electrode in synchronicity with the selection of a scanning signal row electrode to activate each desired row/column pixel, the polarity of the signal applied to each pixel being inverted at a rate not greater than that necessary to activate a single pixel, and greater than the rate



which will cause crosstalk, but in any event greater than the rate needed to scan a row of pixels without inverting polarity.

4,640,583

DISPLAY PANEL HAVING AN INNER AND AN OUTER SEAL AND PROCESS FOR THE PRODUCTION THEREOF

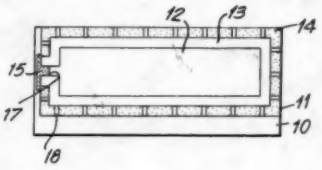
Jun Hoshikawa, and Yukihiro Iwashita, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Seiko Epson, Japan

Filed Jul. 19, 1984, Ser. No. 632,180

Claims priority, application Japan, Jul. 22, 1983, 58-134044; Jul. 28, 1983, 58-138059; Sep. 27, 1983, 58-178434

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—343 **56 Claims**



1. A display panel, comprising:

a pair of spaced apart flexible substrates;

a display medium sandwiched therebetween; and

multiple seal means deposited between the substrates for containing the display medium between the substrates and maintaining the substrates in spaced separation, including a first seal member of a material having the property of strongly adhering to the substrates and a second seal member having the property of low water permeability.

38. A process for the production of a display panel having a pair of spaced apart flexible substrates and a display medium sandwiched therebetween, comprising:

depositing on the interior surface of one substrate a first sealant formed of a material having the property of strongly adhering to the substrates;

depositing on the interior surface of the other substrate, a second seal, formed of a material having the property of low water permeability;

scattering a spacer on at least one of the substrates;

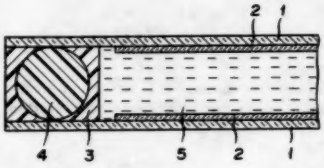
combining the substrates together; and

curing the sealants to form a display panel.

4,640,584
SPACERS FOR LIQUID CRYSTAL DISPLAY DEVICE

Tsuneo Tsubakimoto, Toyonaka; Iwao Fujikawa, Otsu, and Mitsuo Kushino, Minoo, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,903
Claims priority, application Japan, Mar. 24, 1984, 59-55303
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—344 7 Claims

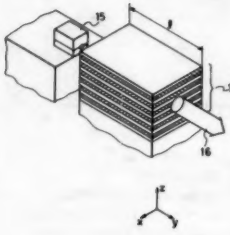


1. A liquid crystal display device, comprising two transparent substrates each provided on the inner side thereof with a transparent electrode, liquid crystal sealed in a space formed between said two transparent substrates, and fine spherical cured particles formed of amino resin obtained from formaldehyde and at least one amino compound selected from the group consisting of benzoguanamine, melamine and urea, and disposed at least in the inner peripheral portion of said two transparent substrates as mixed with an adhesive sealing agent.

4,640,585
SEMICONDUCTOR THIN FILM LENS

Hidetoshi Nojiri, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,757
Claims priority, application Japan, Apr. 28, 1983, 58-75832; Apr. 11, 1984, 59-73817
Int. Cl.[4] G02B 3/00
U.S. Cl. 350—413 9 Claims



1. A semiconductor thin film lens comprising a laminated member comprising a semiconductor A and a semiconductor B alternately layered, said semiconductors A and B satisfying the following conditions:

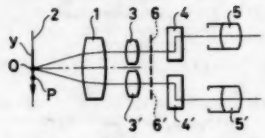
$$n_A > n_B,\ E_{gA} < E_{gB}$$

where E_{gA} is the forbidden bandwidth of said semiconductor A, n_A is the refractive index of said semiconductor A, E_{gB} is the forbidden bandwidth of said semiconductor B, and n_B is the refractive index of said semiconductor B, the thicknesses of the layers of said semiconductor A and said semiconductor B, respectively, having values of several tenths to several one hundredths of wavelengths corresponding to the forbidden bandwidths of said semiconductor A and said semiconductor B, different amounts of impurity being doped into the respective layers, whereby said laminated member as a whole has refractive index gradient which creates a lens action on a light beam entering the lens from the exterior thereof.

4,640,586
OBJECTIVE FOR A BINOCULAR STEREOMICROSCOPE

Yoichi Iba; Tadashi Kimura, and Kazuo Kajitani, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,242
Claims priority, application Japan, Jul. 31, 1984, 59-159368
Int. Cl.[4] G02B 21/02
U.S. Cl. 350—414 10 Claims



1. An objective for a binocular stereomicroscope to be used with a single-objective type binocular stereomicroscope comprising an objective for forming an afocal image, and two observation optical systems for observing said afocal image by the right and left eyes, said objective for a binocular stereomicroscope being arranged to fulfill the condition shown below where reference symbol θ_R represents the angle between a ray that comes from an arbitrary point in a plane to be observed, which is perpendicular to the optical axis of said objective, and passes the center of pupil of one of said observation optical systems after passing through said objective and a ray that comes from the intersecting point of said plane to be observed and the optical axis of said objective and passes said center of pupil of said one of said observation optical systems after passing through said objective, said angle being formed by said two rays just after said two rays come out from said objective, and reference symbol θ_L represents the angle between a ray that comes from said arbitrary point in said plane to be observed and passes the center of pupil of the other one of said observation optical systems after passing through said objective and a ray that comes from said intersecting point of said plane to be observed and the optical axis of said objective and passes said center of pupil of said other one of said observation optical systems after passing through said objective, said angle being formed by said two rays just after said two rays come out from said objective.

$$\left| \frac{\theta_R - \theta_L}{\theta_R} \right| < 0.00775$$

4,640,587
METHOD FOR MANUFACTURING A SPECTACLE LENS FOR MYOPES

Günter Henkel, Dauden, Fed. Rep. of Germany, assignor to N.V. Optimed, Izegem, Belgium

Filed Jan. 23, 1985, Ser. No. 693,728
Claims priority, application Belgium, Jun. 19, 1984, PV 0/213171
Int. Cl.[4] G02B 3/04
U.S. Cl. 350—432 8 Claims

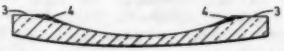
6. An optical lens comprising:

a body having first and second opposite sides, the first side including

(i) a central outwardly concave surface,

(ii) an annular outside milled surface spaced from and extending around the central concave surface, and

(iii) an annular outwardly convex surface extending around the central concave surface and inside the milled surface, and radially smoothly extending from the concave surface to the milled surface;



the lens having a diopter between −21 and −7, and a field of view from 29 mm to 46 mm, and the outwardly convex surface being located outside the field of view.

4,640,588

STEREOSCOPIC MICROSCOPE INCLUDING A ROTATABLE LIGHT BEAM DISTRIBUTING MEANS WITH A SURFACE HAVING DISTRIBUTING AND NON-DISTRIBUTING AREAS

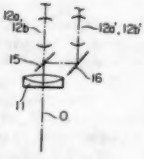
Shinya Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1986, Ser. No. 819,306

Claims priority, application Japan, Jan. 25, 1985, 60-13162

Int. Cl.⁴ G02B *21/22, 27/14*

U.S. Cl. 350—516 **10 Claims**



1. A stereoscopic microscope having:

an objective optical system used in common for left and right observation optical paths;

a first stereoscopic observation optical system having left and right observation optical paths, disposed rearwardly of said objective optical system;

light beam distributing means disposed between said first stereoscopic observation optical system and said objective optical system and rotatable about the optic axis of said objective optical system; and

a second stereoscopic observation optical system rotatable about the optic axis of said objective optical system with the rotation of said light beam distributing means;

wherein said light beam distributing means is provided with a light beam distributing surface, and said light beam distributing surface has a light beam distributing area for distributing light received thereon to said second stereoscopic observation optical system, and said light beam distributing surface also has a non-distributing area for transmitting light received thereon to said first stereoscopic observation optical system.

4,640,589

MICROSCOPE ILLUMINATOR

William N. Reich, San Mateo, Calif., assignor to Spectrolyte, Inc., San Mateo, Calif.

Division of Ser. No. 464,961, Feb. 8, 1983, abandoned, which is a division of Ser. No. 405,253, Aug. 4, 1982, abandoned. This application Mar. 3, 1986, Ser. No. 836,713

Int. Cl.⁴ G02B *21/24*

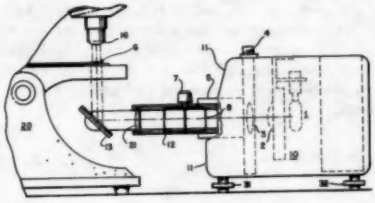
U.S. Cl. 350—523 **3 Claims**

1. A microscope illuminator comprising:

a point source of illumination including an incandescent bulb and means for increasing the intensity of illumination from said point source by varying the voltage applied to said point source of illumination;

an aspheric lens capable of blocking infrared radiation from said point source of illumination and directing the illumination from said point source along a predetermined optical path;

a narrow band pass dichroic filter mounted for rotation about an axis perpendicular to the optical path of illumination to permit only a limited plurality of wavelengths of



radiation along the optical path and capable of transmitting a preselected plurality of wave lengths along the pathway; and

means for adjustably directing the resulting radiation substantial normal to the pathway so as to be able to be directed onto and through a specimen to be observed in a position to be viewed by a microscope.

4,640,590

APPARATUS PROVIDING RAPID ADJUSTMENT OF A MIRROR

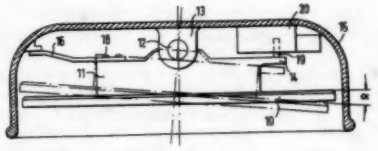
Erich Wunsch, Bad Liebenzell, Fed. Rep. of Germany, assignor to Efrudec GmbH, Fed. Rep. of Germany

Filed Jun. 21, 1985, Ser. No. 747,359

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423520

Int. Cl.⁴ G02B *7/18, 5/08*

U.S. Cl. 350—632 **18 Claims**



1. An apparatus providing rapid adjustment of a mirror which is pivotable about a vertical axis and disposed in a mirror housing, wherein said mirror is adjustable from an initial adjustment position by a preset pivot angle to a final adjustment position and automatically returnable to said initial adjustment position, said apparatus comprising: a mirror housing (15) having journal bearings (13) aligned on a vertical axis; an adjuster unit (11) having journals (12) aligned on said vertical axis and mounted in said journal bearings (13); a mirror mounted on said adjuster unit (11); a spring means (16) in force relation between said mirror housing (15) and a first side of said adjuster unit (11) displaced from said vertical axis; an actuator means (19) of said adjuster unit (11) at a second side of said adjuster unit displaced from said vertical axis opposite to said first side; a rotatable operating disk (21) having a contoured peripheral control curve and a drive pin (34) extending therefrom, said actuator means (19) maintained in contact with said contoured peripheral control curve by said force of said spring means (16); said contoured peripheral control curve defining a cycle comprising an angular initial position (25), a movement arc (26), a final adjustment position (27), a rest phase arc (28), and a return arc (30); a drive shaft (38) with a drive section (37)

extending therefrom and means for rotating said drive shaft in a direction of rotation (31), said drive shaft (38) coupled to said operating disk (21) by a clutch means coupling said drive section (37) to said drive pin (34), said clutch means providing a monodirectional link between said drive shaft (38) and said operating disk (21) in said direction of rotation (31) whereby said operating disk (21) is rotatable in said direction of rotation (31), causing said actuator means (19) to sequentially contact said movement arc (26), said rest phase arc (28) and said return arc (30) comprising one said cycle of said peripheral control curve and thereby providing adjustment of said mirror from said initial adjustment position through said preset pivot angle to a final adjustment position and back to said initial adjustment position.

4,640,591

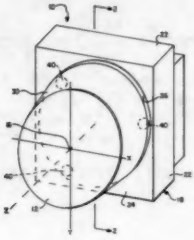
SUPPORT MECHANISM FOR A MIRRORED SURFACE OR OTHER ARRANGEMENT

Ronald W. Cutburth, Tracy, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 8, 1985, Ser. No. 796,464

Int. Cl.⁴ G02B *7/18, 5/08*

U.S. Cl. 350—632 **10 Claims**



1. A mechanism for supporting first means including a planer surface for movement relative to a vertical plane defined by particular intersecting x and y axes which extend horizontally and vertically, respectively, said mechanism comprising:

(a) second means including a plurality of segments of an annular surface which forms part of a sphere whose center defines the intersection of said x and y axes, said annular surface defining a z axis extending through the intersection of said x and y axes perpendicular to said vertical plane;

(b) third means connecting said planer surface including first means with said second means such that said planer surface is positionable within said vertical plane and is itself intersected by said z axis at a particular point thereon, said third means including bearing means disposed between said first means and said segments of said annular surface of said second means for allowing said first means to move in any direction on said annular surface segments including certain specific directions which allow said planer surface to pivot back and forth to a limited extent about both said x and y axes relative to said vertical plane; and

(c) fourth means interconnecting said first and second means and cooperating with said third means for limiting the movement of said first means to said certain specific directions and thereby limiting the movement of said planer surface to said back and forth pivotal movement about said x and y axes, whereby said particular point defined at the intersection of the z axis with said planer surface remains substantially fixed at the intersection of said x and y axes and within said vertical plane.

4,640,592

OPTICAL DISPLAY UTILIZING THERMALLY FORMED BUBBLE IN A LIQUID CORE WAVEGUIDE

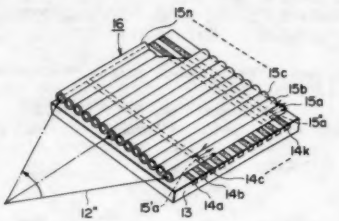
Yukuo Nishimura, Sagamihara; Toshiaki Asano; Nobutoshi Mizusawa, both of Yokohama; Eigo Kawakami, Kawasaki; Masahiro Haruta, Funabashi; Takashi Noma, Tokyo; Hiroshi Takagi, Yokohama; Mitsunobu Nakazawa, and Kunitaka Ozawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 570,810

Claims priority, application Japan, Jan. 22, 1983, 58-8873; Jan. 22, 1983, 58-8874; Jan. 22, 1983, 58-8875; Jan. 22, 1983, 58-8876

Int. Cl.⁴ G02B *6/20*; G09G *3/04*; G09F *13/00*; F21V *7/04*

U.S. Cl. 350—96.32 **9 Claims**



1. An optical device comprising an optical waveguide having, as a basic unit, a core layer of a liquid having a relatively high refractive index and a clad layer having a relatively low refractive index and covering said core layer, heat generating means for heating a part of said core layer to form a vapor bubble in said liquid of said core layer, said heat-generating means being positioned externally of said waveguide and including a plurality of elongated heating members crossing a longitudinal direction of said waveguide, means for selectively heating said heating members, said selective heating means being positioned externally of said waveguide, means for causing light to be incident on said waveguide along said longitudinal direction and cooling means for eliminating said vapor bubble.

3. An optical device comprising an optical waveguide panel having optical waveguide channels comprising core layers formed by filling a transparent liquid having a relatively high refractive index in parallel channels formed in a combined clad layer of a relatively low refractive index obtained by adhering a transparent flat clad layer having stripe-shaped grooves in a surface therein and a flat clad layer, heat-generating means for heating a part of said core layer to form a vapor bubble in said liquid of said core layer, said heat-generating means being positioned externally of said waveguide channels and including a plurality of elongated heating members crossing a longitudinal direction of said waveguide channels, means for selectively heating said heating members, said selective heating means being positioned externally of said waveguide channels, means for causing light to be incident on said waveguide channel along said longitudinal direction and cooling means for eliminating said vapor bubble.

4,640,593

PROGRESSIVE MULTIFOCAL OPHTHALMIC LENSES

Toshihide Shinohara, Suwa, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,211

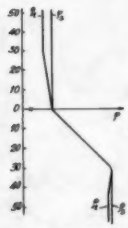
Claims priority, application Japan, Sep. 29, 1982, 57-170627

Int. Cl.⁴ G02C *7/06*

U.S. Cl. 351—169 **20 Claims**

1. A progressive multifocal ophthalmic lens comprising a refractive surface divided into a far vision viewing zone, an intermediate vision viewing zone and a near vision viewing zone, a substantially vertical principal meridian curve, an optical center of said far vision viewing zone being at the lower

end of said principal meridian curve in said far vision viewing zone, and an optical center of said near vision viewing zone being at the upper end of said principal meridian curve in said near vision viewing zone, the curvature of said principal meridian curve changing between the optical center of said far vision viewing zone and the optical center of said near vision viewing zone in accordance with a prescribed law to define the



additional power of said lens, the difference ($\Delta\rho$) between the curvature (ρt) along said principal meridian curve and the curvature (ρs) along the vertical direction with respect to said principal meridian curve at each point on said principal meridian curve, ($\Delta\rho = |\rho s - \rho t|$) is not zero along at least a portion of said principal meridian curve in at least one of said far vision viewing zone and said near vision viewing zone.

4,640,594

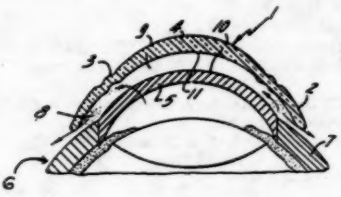
TEAR PUMP CONTACT LENS

Richard Berger, P.O. Box 189, Woodbury, N.Y. 11797

Continuation-in-part of Ser. No. 337,725, Jan. 7, 1982, abandoned. This application Sep. 13, 1984, Ser. No. 649,983

Int. Cl.⁴ G02C 7/04

U.S. Cl. 351—160 R **4 Claims**



1. A semi-rigid polymeric corneal contact lens made to float upon and adhere to the cornea comprising a transparent, non-contacting, non-distorting central optical lens zone adapted to conform with the cornea and float on tear fluid, said central optical zone having an optical center, and inner and outer surface with the inner surface adjacent the tear fluid, and an intermediate reticulated zone of the same material as the central zone and of substantially uniform thickness but with at least one concave and one convex surface in relation to the cornea which is in the shape of a bellows to provide limited axial movement of the central zonea whenever an eyelid blink transmits a force to the central zone which displaces the intermediate zone in an axial inward direction with the cornea of the eye, without actually touching the cornea, to effect out flow of tear fluid from a fluid chamber, between the cornea and the eye, and at the completion of the blink to restore the central zone to an initial equilibrium position thereby creating a pressure differential to draw fresh tear fluid back into the tear chamber.

4,640,595

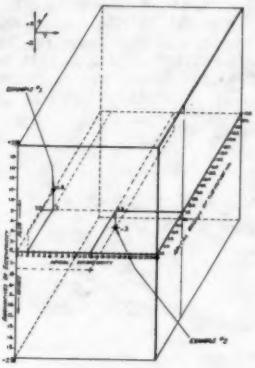
ASPHERIC CONTACT LENS

David Volk, 3336 Kersdale Rd., Pepper Pike, Ohio 44124

Filed May 2, 1984, Ser. No. 606,140

Int. Cl.⁴ G02C 7/04, 7/06

U.S. Cl. 351—160 R **24 Claims**



1. A contact lens made of transparent homogeneous optical material and of a diameter between 7 and 14 mm to fit the human eye, having at least one of its surfaces a novel aspheric surface of revolution with an apical unbilical point at which the derivative of curvature vanishes and wherein said surface decreases continuously and regularly in curvature along a meridian from its apex to its peripheral edge and wherein said surface varies continuously and regularly in eccentricity from its apex to its periphery.

4,640,596

OBJECTIVE REFRACTOR FOR THE EYE

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Continuation-in-part of Ser. No. 202,536, Oct. 31, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,607

Int. Cl.⁴ A61B 3/10

U.S. Cl. 351—211 **8 Claims**

1. Apparatus for testing the eye along an optical axis comprising in combination:

a first linearly aligned knife-edge at first angle with respect to said optical axis;

a second linearly aligned knife-edge at an angle with respect to said first knife-edge;

means for illuminating each of said knife-edges;

means for projecting an image of said illuminated knife-edges to the eye;

optical means between said eye and knife-edges for providing a prescription including variable spherical input and variable cylindrical input between said eye and knife-edges;

a detector at the opposite end of said optical axis having segments for receiving light from said eye, said detector positioned to receive the light over said knife-edges; and

means operatively connected between said detector seg-

ments and said optical means for varying the prescription between said eye and detector.

4,640,597

MICRO-READER

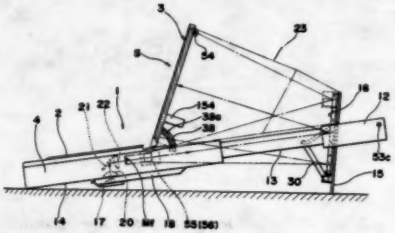
Takeshi Okano, Nishinomiya; Sadaaki Nakaoka, Osaka, and Saichiro Ohashi, Otokuni, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 11, 1985, Ser. No. 700,157

Claims priority, application Japan, Feb. 10, 1984, 59-23888; Aug. 28, 1984, 59-131151[U]; Aug. 28, 1984, 59-131154[U]; Aug. 28, 1984, 59-131155[U]; Aug. 28, 1984, 59-131159[U]

Int. Cl.[4] G03B *21/28*

U.S. Cl. 353—79 **6 Claims**



1. A micro-reader in which an optical system is utilized for projecting on a screen a magnified reproduction of an image on a microfilm, said micro-reader comprising:

a generally rectangular box-like, flattened, casing including opposed side walls;

a moveable member supported by the casing for movement between longitudinally retracted and extended positions in a direction parallel to the opposed side walls of the casing;

a viewing screen mounted on and supported by the casing for movement between folded and raised positions;

an optical system for projecting the image onto the screen;

a lamp for illuminating the image on the screen; and

a reflecting mirror member supported by said moveable member for movement between a laid-down position and an upright position facing said screen for reflecting the imagewise light from the optical system towards the screen when in the upright position and, when at the same time, the screen is held in the erected position, whereby; when the micro-reader is not in use, the screen and the mirror member are held in the retracted, folded and laid-down positions, respectively, said screen and said mirror member constitute cover members for covering the top and bottom of a portion of the space between the casing and the moveable member, but when the micro-reader is in use, the screen and the mirror member are held in the extended raised and upright positions, respectively, and the mirror member confronts the screen at a predetermined angle while lying in a plane different from the plane which is occupied by the mirror member when in the laid-down position.

4,640,598

POWER WINDER ATTACHMENT FOR A CAMERA

Taichi Yoshida, 2-4-8-903, Otsuka, Bunkyo-ku, Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,389

Int. Cl.[4] G03B *1/12*

U.S. Cl. 354—173.1 **10 Claims**

1. A power winder attachment adapted to be secured to a camera comprising:

a housing;

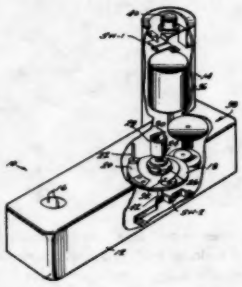
a battery-driven motor located within the housing;

support means journalled for rotation within said housing;

means for connecting the motor to said support means so as to rotate the support means during operation of the motor;

a leaf spring secured at one of its ends to said support means;

a shutter-release pin slidably retained by said housing and positioned so as to be engaged by the opposite end of the leaf spring as the spring is moved during rotation of the support means, said engagement between the spring and the pin causing the pin to slide outwardly from the housing;



a film winder mechanism journalled within said housing; and

winder actuator means joined to said support means for engaging the winder mechanism during rotation of the support means to pivot the winder mechanism in one direction from a first position to a second position and then to pivot the winder mechanism in the opposite direction to return the winder mechanism to said first position.

4,640,599

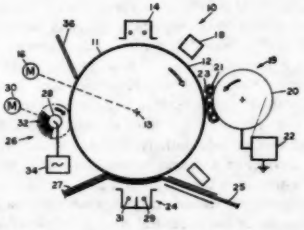
METHOD AND APPARATUS FOR NEUTRALIZING RESIDUAL CHARGE ON A PHOTOCONDUCTIVE SURFACE

George J. Doutney, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 15, 1985, Ser. No. 787,347

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 CH **7 Claims**



1. In a device for discharging residual charge on a photoconductive surface of a reversal development type printer, the combination comprising: a brush in contact with the photoconductive surface, means for rotating said brush, means for conveying said photoconductive surface past said brush, and means for applying an AC potential to said brush.

4,640,600
FIXING DEVICE

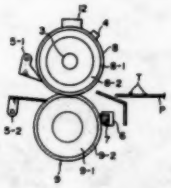
Hiromitsu Hirabayashi, and Masaaki Sakurai, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,071

Claims priority, application Japan, Oct. 15, 1982, 57-181815; Oct. 20, 1982, 57-183995; Jan. 8, 1983, 58-1561; Jul. 6, 1983, 58-123706; Jul. 8, 1983, 58-125075

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 355—3 FU **40 Claims**



1. A fixing device comprising:

a first rotatable member and a second rotatable member for gripping and transporting a recording material to fix a toner image having a predetermined electric polarity onto the recording material, wherein said first rotatabie member is positioned to be contactable with a face of the recording material bearing the toner image, and said second rotatable member is positioned to be contactable with a back face of the recording material, and wherein said first rotatable member and said second rotatable member each have an electrically insulating surface layer; and electrification agent applying means for applying to said second rotatable member an electrification agent which causes charging of said second rotatable member to an electric polarity opposite to the electric polarity of the toner image through a friction between the recording material and said second rotatable member, whereby the electric charge of said second rotatable member attracts the toner image to the recording material to prevent the toner image from offsetting to said first rotatable member.

4,640,601
PATENT IMAGE REPRODUCING ELECTROPHOTOGRAPHIC MACHINE

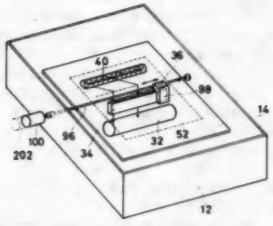
Yutaka Deguchi, Himeji, and Yasuyuki Tsuchida, Hyogo, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Dec. 19, 1984, Ser. No. 683,791

Claims priority, application Japan, Dec. 20, 1983, 58-241203; Feb. 6, 1984, 59-20182; Feb. 6, 1984, 59-20183; Feb. 6, 1984, 59-20184; Feb. 7, 1984, 59-20956

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **42 Claims**



1. An electrophotographic copying machine comprising:

a photosensitive member,

charging means for charging said photosensitive member,

a first light source for exposing an original copy,

first electrostatic latent image forming means for forming an original copy image formed by said first light source on said photosensitive member as a first electrostatic latent image,

additional information providing means for providing an additional information other than said original copy,

displaying means for displaying said additional information,

a second light source for forming an image of said additional information, and

second electrostatic latent image forming means for forming said additional information image formed by said second light source on said photosensitive member as a second electrostatic latent image,

said photosensitive member including a material sensitive to both said first and second light sources, further

developing means for developing said first and second electrostatic latent images formed on said photosensitive member by toner as a toner image, and

transferring means for transferring said toner image formed by said developing means on paper.

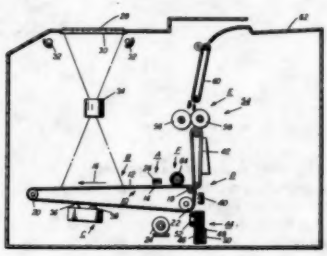
4,640,602
SHEET FEEDER-STACKER

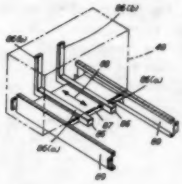
Thomas P. Redding, Penfield, and Laurence S. Barker, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,439

Int. Cl.⁴ G03G *15/00, 21/00*

U.S. Cl. 355—3 SH **5 Claims**





1. An electrophotographic printing machine of the type having a toner image formed on a photoconductive belt wherein successive flexible sheets advance to a transfer station for receiving toner images thereat, wherein the improvement includes:

means for holding a stack of sheets in a substantially vertical orientation;

means for feeding successive, outermost sheets from one side of the stack in said holding means in a substantially vertical direction opposed to the direction of the gravitational force exerted thereon;

means, arranged to receive successive sheets from said feed-

ing means, for transporting the sheets to the transfer station for receiving the toner image thereat;

at least one upright member having a planar surface engaging the outermost sheet of the other side of the stack in said holding means; and

means for advancing said upright member toward said feeding means to translate the stack with respect to said holding means in a substantially horizontal direction toward said feeding means so as to position successive, outermost sheets of said one side of the stack in said holding means in feeding relationship therewith, said holding means being arranged to move from an operative location in which said advancing means positions the outermost sheet of said one side of the stack in feeding relationship with said feeding means to an inoperative location spaced from said advancing means and said member for loading a new stack of flexible sheets therein.

4,640,603

COPYING APPARATUS

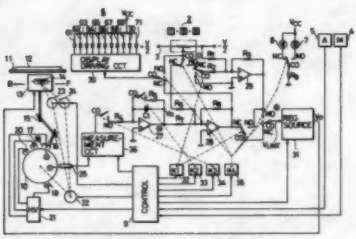
Toshio Honma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1983, Ser. No. 532,144

Claims priority, application Japan, Sep. 24, 1982, 164979; Sep. 24, 1982, 164980

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **10 Claims**



1. A copying apparatus comprising:

image forming means for forming a copy image of an original on a recording member;

setting means for manually setting the copy density of the image to be formed by said image forming means;

detecting means for detecting the density of said original;

selecting means for selecting either a first mode in which said copy density is set by said setting means without regard to the density of the original or a second mode in which said copy density is set in response to an output of said detecting means; and

adjusting means for permitting said setting means to adjust said copy density, which has been set in response to the output of said detecting means when the second mode is selected, within a predetermined range without releasing the second mode.

4,640,604

ELECTROSTATIC PHOTOGRAPHIC COPYING MACHINE PROVIDED WITH A MOVABLE SORTER

Nobuhiko Kozuka; Shigeo Koyama, both of Osaka, and Atsushi Kano, Amagasaki, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 17, 1983, Ser. No. 476,377

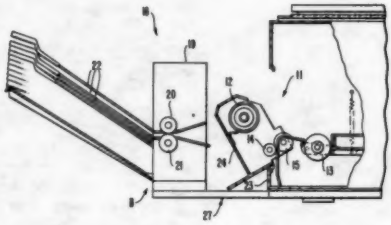
Claims priority, application Japan, Apr. 4, 1982, 57-49165[U]

Int. Cl.⁴ G03G *15/00, 21/00*

U.S. Cl. 355—3 R **4 Claims**

1. In an electrostatic photographic copying machine of the type including a machine body, means for electrostatically transferring copied images to sheets of copying paper moved in a feed direction, means for fixing said images on said sheets and discharging said sheets in said direction, and a sorter mounted on said body for receiving and sorting said discharged sheets, the improvement comprising:

means for mounting said sorter on said body such that the entire said sorter is selectively movable, in said direction of discharge of said sheets, between a first position mechanically connected to said body, whereat said sorter is adjacent said body and said fixing means for receipt therefrom of said discharged sheets, and a second position mechanically connected to said body, whereat said entire sorter is spaced in said direction form said body and said fixing means, with a space between said sorter and said



fixing means sufficiently large to enable removal of any sheets jammed in said sorter or said fixing means, said mounting means comprising link supporting members fixed to opposite sides of a lower portion of said body and extending therefrom in said direction, pairs of parallel links connecting said sorter to said link supporting member, each said link having a lower first end pivotally connected to a respective said link supporting member and an upper second member pivotally connected to a respective side of said sorter, whereby said sorter is movable between said first and second positions by pivoting said links about said lower first ends thereof.

4,640,605

APPARATUS FOR FORMING MULTICOLOR ELECTROPHOTOGRAPHIC IMAGES THROUGH WET-TYPE DEVELOPING PROCESS

Kenzo Ariyama, Kanagawa; Tsuneo Kurotori, Tokyo, and Manabu Mochizuki, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Oct. 2, 1985, Ser. No. 783,025

Claims priority, application Japan, Oct. 2, 1984, 59-149485[U]; Nov. 9, 1984, 59-236229; Nov. 9, 1984, 59-236230; Nov. 9, 1984, 59-236231; Dec. 24, 1984, 59-272588

Int. Cl.⁴ G03G *15/01, 15/06*

U.S. Cl. 355—4 **49 Claims**

1. An apparatus for forming multicolor electrophotographic images through a wet-type developing process, comprising:

a latent image carrier rotatable in one direction about its own axis;

charging means for charging said latent image carrier;

an optical system for forming an electrostatic latent image on said latent image carrier;

a rotatable development body disposed adjacent to said latent image carrier and rotatable in one direction for supplying a developer to said latent image carrier to visualize a latent image formed on the latent image carrier;

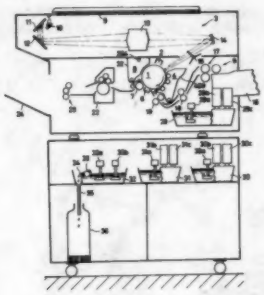
a development housing in which said rotatable development body is rotatably accommodated;

a plurality of developer tanks for storing developers of different colors, respectively;

developer supply means for selectively supplying the developer from one of said developer tanks to said development housing and for returning the developer having developed the image to said one of the developer tanks;

transfer means for transferring the visible image from said latent image carrier to an image transfer sheet;

a sheet feeder device for feeding the image transfer sheet to said latent image carrier;



a first cleaning device for removing the residual developer from said latent image carrier after the visible image has been transferred therefrom; and

a second cleaning device for supplying a cleaning solution to said development housing to clean the development housing and said rotatable development body.

4,640,606

CORONA DISCHARGER FOR SEPARATING COPY PAPER FROM PHOTORECEPTOR IN ELECTROPHOTOGRAPHIC COPYING MACHINE

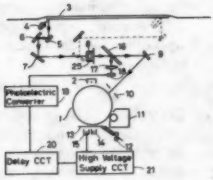
Kiyoshi Inamoto, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1984, Ser. No. 577,800

Claims priority, application Japan, Feb. 15, 1983, 58-24309

Int. Cl.[4] G03G *15/14*

U.S. Cl. 355—14 TR **5 Claims**



1. An electrophotographic copying machine comprising:

photoreceptor means for forming a latent image thereon corresponding to an image of a document based on light reflected by said document;

transfer means for transferring said latent image onto a copy paper while said copy paper is close to the photoreceptor; and

separation corona discharger means actuated by a selected voltage for causing a corona discharge to said copy paper so that said copy paper is permitted to electrostatically separate from said photoreceptor;

photodetector means for sensing the amount of light reflected from said document; and

control means responsive to the photodetector means for applying the selected voltage to said separation corona discharge means, the selected voltage being proportional to the amount of light reflected from said document.

4,640,607

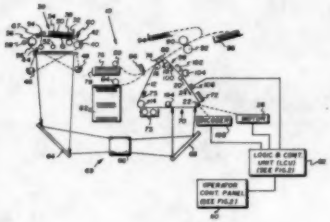
SIMPLEX TO DUPLEX COPIER APPARATUS

Richard L. Bray, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1984, Ser. No. 680,707

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **6 Claims**



1. Apparatus for copying a set of simplex originals to produce a set of duplex copies having subsets in which the first page of each subset is on the front side of a copy comprising:

producing means for producing images of originals, said producing means including an exposure position;

recirculating means for receiving a set of simplex originals at a receiving position and for sequentially recirculating individual originals from said receiving position to said exposure position and then back to said receiving position;

supply means for selectively supplying copy sheets to receive images from said producing means; and

control means operable (1) in a setup mode for controlling said circulating means to circulate originals one at a time under operator control, said control means including operator actuatable means for designating individual simplex originals as the first pages of subsets of copies and (2) in a producing mode for controlling (a) said circulating means to circulate said simplex originals to said exposing position, (b) said producing means to produce sequential images of said originals, and (c) said supply means to supply to said producing means copy sheets to receive images of simplex originals on the front and back sides of said copy sheets with the designated first page of each subset being received on the front side of a copy sheet.

4,640,608

CLEANING METHOD FOR USE IN ELECTROPHOTOGRAPHY

Toshiaki Higuya; Masaaki Ogura, both of Kanagawa; Takato Yano, Saitama; Kiyozo Hashizume, Tokyo; Toshiyuki Ogawa, and Nachio Seko, both of Kanagawa, all of Japan, assignors to Ricoh Co., Ltd., Japan

Continuation of Ser. No. 31,415, Apr. 19, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 250,929

Claims priority, application Japan, May 11, 1978, 53-55957

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **2 Claims**

1. In a method for cleaning residual toner particles remaining on the surface of a photoconductor movable cyclically in an electrophotographic copying apparatus, comprising:

bringing a cleaning blade into pressure contact with said photoconductor by actuating a solenoid connected resiliently to a lever to pivot said lever and thereby urge said blade against said photoconductor;

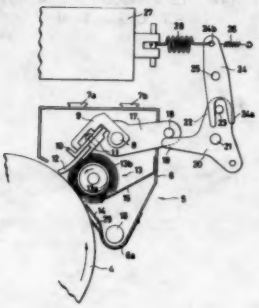
energizing the drive means for said photoconductor a first time period after actuation of said solenoid;

de-energizing the drive means for said photoconductor upon completion of a copying cycle;

removing said cleaning blade from contact with said photoconductor by actuation of said solenoid a second time period after de-energizing said drive means;

removing toner collected by the blade by a brush roller

rotated adjacent said blade in a direction whereby its peripheral surface moves opposite the movement of said photoconductor, said cleaning blade and brush roller



being mounted in a housing having a seal member riding along said photoconductor, said brush roller being rotated adjacent said seal member to clean toner therefrom.

4,640,609

LIGHT SOURCE FOR A COLOR ENLARGEMENT

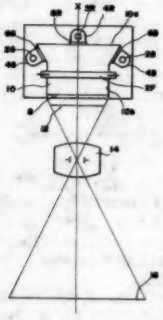
Hitoshi Yasumoto, Tondabayashi, and Tetsuyuki Tanimoto, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1984, Ser. No. 635,814

Claims priority, application Japan, Aug. 5, 1983, 58-122436[U]

Int. Cl.⁴ G03B *27/54*

U.S. Cl. 355—37 **16 Claims**



1. A light source device for a color enlarger which includes a projection lens having an optical axis, comprising:

means for emitting red light toward a film to be enlarged, said red light emitting means including at least a linear light source located perpendicularly to said optical axis;

means for emitting blue light toward said film, said blue light emitting means including at least a linear light source;

means for emitting green light toward said film, said green light emitting means including at least a linear light source, the linear light source of said green light emitting means and the linear light source of said blue light emitting means being arranged to be symmetrical with respect to said optical axis and to be in parallel with each other; and

means for illuminating said film with a substantially constant brightness having a linear light source which is located, in a plane perpendicularly to the optical axis, perpendicularly to the linear light source of said red light emitting means.

4,640,610

REPRODUCTION CAMERA

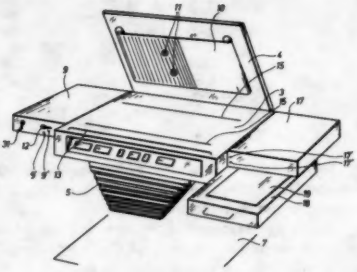
Vagn N. Rasmussen, Gentofte, and Finn Hougaard, Copenhagen, both of Denmark, assignors to Eskofot A/S, Ballerup, Denmark

Filed May 9, 1985, Ser. No. 732,410

Claims priority, application Denmark, Sep. 3, 1984, 4214/84

Int. Cl.⁴ G03B *27/60*

U.S. Cl. 355—73 **5 Claims**



1. A reproduction camera comprising: a supporting frame with an original plane, an objective plane and a picture plane, said planes being mutually displaceable toward and away from each other; a delivery roll adjacent one end of the picture plane for holding a roll of light sensitive material; a first pair of rollers for advancing light sensitive material from the delivery roll toward the picture plane; means for cutting the light sensitive material when a desired length thereof has been delivered by said rollers; a developing container adjacent the end of the picture plane which is opposite the delivery roll; and an opaque conveyor band overlying the picture plane and serving as a flexible cover for transporting the light sensitive material to the picture plane and thence to the developing container after the light sensitive material has been cut by said cutting means, said conveyor band being provided with transverse grooves which can be evacuated and said conveyor band including at least one suction cup facing the picture plane.

4,640,611

COPYING METHOD FOR BOOKBINDING

Eishu Ohdake; Tomohiro Oikawa, both of Yokohama; Kenichi Shimizu, Kawasaki; Takashi Seto, Ayase; Masahiro Ishikawa, Hiratsuka; Shigeru Suzuki, Yokohama, and Izumi Tagoku, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,428

Claims priority, application Japan, May 30, 1984, 59-110090; May 31, 1984, 59-111601; May 31, 1984, 59-111602; Jun. 26, 1984, 59-131672

Int. Cl.⁴ G03B *27/32*

U.S. Cl. 355—77 **7 Claims**

1. A copying method for bookbinding which copies documents on papers each being double the size of the documents by means of a copier, comprising the steps of:

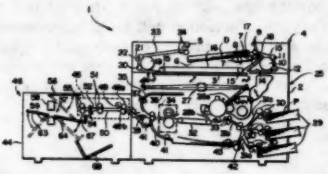
(a) setting up a relation

$$\frac{N}{4} \leq I < \frac{N}{4} + 1$$

where N is a total number of pages of documents and I is a number of papers necessary for copying the N documents pages, and, considering that a front face and a back

face of one half of the paper are paged in this sequence, duplicating a page 2i−1 of the documents on a front face of one half of the i-th paper and a page 2i of the documents on a back face of the i-th paper;

(b) copying a page 2I of the documents on a back face of one half of a last paper and a page 2I+1 of the documents on a back face of the other half of the last paper; and



(c) considering that a back face and a front face of the other half of the paper are paged in this sequence toward the first paper, duplicating a page 4I−2I+1 on a back face of the other half of the i-th paper and a page 4I−2i+2 of the documents on a front face of the i-th paper.

4,640,612

METHOD AND APPARATUS FOR CONTROLLING CONTINUOUSLY OPERATION OF AUTOMATIC PHOTO-COMPOSER

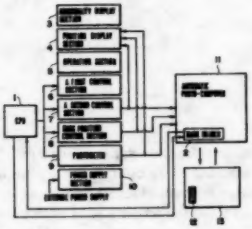
Yuki Watanabe, and Hiroshi Tozaki, both of Tokyo, Japan, assignors to Hosen Printing Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,559

Claims priority, application Japan, Nov. 24, 1984, 59-246991

Int. Cl.⁴ G03B *27/20*

U.S. Cl. 355—87 **4 Claims**



1. A method of controlling the operation of an automatic photo-composer continuously and automatically, the steps comprising:

attaching a mark which indicates necessary processes to be executed to a photographic original plate in said photo-composer,

reading the contents of said mark by a mark reader provided in said photo-composer to thereby discriminate the contents of process necessary for said photographic original plate,

moving a photosensitive plate to a predetermined position,

moving a printing frame to which said photographic original plate is contacted to a predetermined position,

controlling the positions of four, that is, upper, lower, right and left light shielding films provided in said printing frame to automatically form a light shielding mask necessary for said photographic original plate,

printing said photosensitive plate by a predetermined amount of exposure,

controlling the positions of said light shielding films to form a mask for exposing the unnecessary area on said photosensitive plate simultaneously with said light shielding mask as occasion demands,and exposing the unnecessary area on said photosensitive plate, and

moving said light shielding mask and said printing frame to the predetermined positions to print repeatedly in response to the number of duplicate printing in case of the multiduplicate printing.

4,640,613

IMAGE DATA COMPARISON CIRCUIT FOR RANGEFINDERS

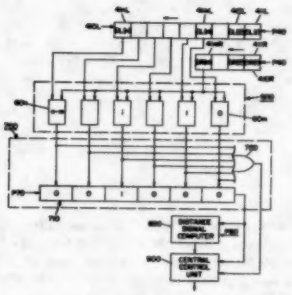
Shotaro Yokoyama, and Takashi Nishibe, both of Kanagawa, Japan, assignors to Fuji Electric Corporate Research and Development, Ltd. and Fuji Electric Company, Ltd., both of Kanagawa, Japan

Filed May 31, 1984, Ser. No. 615,880

Claims priority, application Japan, Jun. 21, 1983, 58-111173

Int. Cl.⁴ G01C *3/00, 5/00;* G03B *3/00*

U.S. Cl. 356—1 **2 Claims**



1. An image data comparison circuit for a rangefinder wherein two digital image signal trains from corresponding optical sensor arrays are compared while being shifted relatively to each other so that the distance to an object can be determined from the number of shifts between the digital image signal trains at the time the digital image signal trains have maximum coincidence, said data comparison circuit comprising a pair of shift registers for storing image data items from the two digital image trains, respectively, at least one of the shift registers being arranged to transmit stored image data items in parallel, coincidence detector means responsive to receipt of image data items transmitted from the shift registers, for detecting data coincidence of image data items from the two image signal trains, simultaneously, for a plurality of said relative shifts of the image data items, and counter means for counting output signals of the coincidence detector means indicative of results of image data coincidence detection by the coincidence detector means.

4,640,614

TESTING SAMPLES

David Roberts, Maple Durham, Near Reading, and Michael R. Williams, Stokenchurch, both of United Kingdom, assignors to Ranks Hovis McDougall plc, United Kingdom

Filed Dec. 7, 1984, Ser. No. 679,570

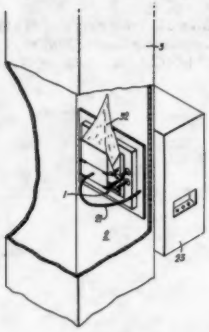
Claims priority, application United Kingdom, Dec. 7, 1983, 8332675

Int. Cl.⁴ G01N *21/01*

U.S. Cl. 356—36 **2 Claims**

1. A method of testing a sample of particulate material which includes permitting a continuous stream of the material to fall freely through a vertical chute having at least one sidewall and a given horizontal cross-sectional area, positioning in said vertical chute a trap having vertical wall members defining a trap chamber having a horizontal cross-sectional area much smaller than the horizontal cross-sectional area of said chute,

said trap chamber having a top and a bottom which allow a portion of said stream of particulate material to fall through said trap chamber when both said top and bottom are open, one of said vertical wall members of said trap being a portion of said one side wall of said chute and having a window made of transparent material, said trap including a top closure member movable relative to said vertical wall members between an open position at which the top of said chamber is open to receive material from said stream and a closed position at which the top of said chamber is closed to prevent the entry of material from said stream, and said trap also including a bottom closure member movable relative to said vertical wall members between an open position at which the bottom of said chamber



is open to permit material to fall from said chamber into said stream and a closed position at which the bottom of said chamber is closed to prevent material from falling from said chamber, moving said top closure member to its closed position and said bottom closure member to its open position, then purging said trap chamber by flowing air into said trap chamber to loosen remnant material and permit it to fall through the now open bottom of said trap chamber, then terminating said flow of air and thereafter moving said bottom closure member to its closed position and said top closure member to its open position and permitting a sample mass of material to accumulate in said trap chamber, and then testing said sample mass through said window by instrumental means located outside of said chute.

4,640,615

LIQUID REFRACTOMETER

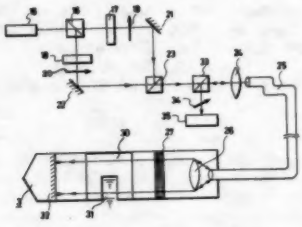
Issei Sasaki, 15-402, Hanakawa-Cyuo-Danchi, 3-4, Hanakawa-kita 3-chome, Ishikari-machi, Ishikari-gun, Hokkaido, Japan, assignor to Issei Sasaki and Seiko Instruments & Electronics Ltd., both of Tokyo, Japan, a part interest

Filed Oct. 15, 1984, Ser. No. 660,923

Claims priority, application Japan, Oct. 20, 1983, 58-197093

Int. Cl.[4] G01N *21/41*

U.S. Cl. 356—130 **27 Claims**



1. A liquid refractometer comprising: a light source unit for generating a polarized mixed light composed of two coherent light waves that have been polarized in directions crossing each other at right angles; a probe unit having a sample holding portion for holding a liquid sample, a reference portion, polarization separation means for separating said polarized mixed light back to the two polarized light waves and for propagating one of the two waves through said sample holding portion and propagating the other of the two waves through said reference portion, and means for re-mixing the two waves after propagation thereof through said sample holding portion and said reference portion; a detection unit for effecting measurement of the refractive index difference between the liquid sample and the reference portion upon receiving the re-mixed light; and light guide means for optically connecting said light source, probe unit and detection unit.

4,640,616

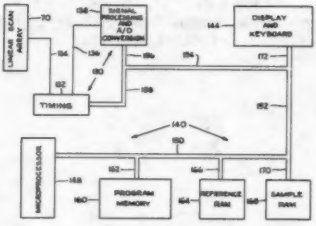
AUTOMATIC REFRACTOMETER

John K. Michalik, Sloan, N.Y., assignor to The Cambridge Instrument Company plc, Cambridge, England

Filed Dec. 6, 1984, Ser. No. 678,932

Int. Cl.[4] G01N *21/43*

U.S. Cl. 356—136 **23 Claims**



1. An automatic refractometer comprising:

(a) a linear scanned array comprising a plurality of photoelectric elements, each element providing an output pulse during a scan and the amplitude of each pulse being determined by the amount of illumination of the corresponding element by incident light;

(b) optical means for directing light onto said array, the particular photoelectric elements of said array which are illuminated by said light being determined by the index of refraction of a light transmitting substance placed in operative association with said optical means;

(c) means for converting the signals from said linear scanned array into digital signals containing information as to the amplitudes of said signals from said array;

(d) digital processing circuit means for storing respective digital signals from reference and sample substances placed in operative association with said optical means and for computing the index of refraction of the sample substance by means of a comparison of the stored reference and sample signal information, said digital processing circuit means including means for matching reference curve data and sample curve data and searching for the critical angle of total reflection indicated by rapidly increasing amplitude of said signals from said array resulting from rapidly increasing light intensity; and

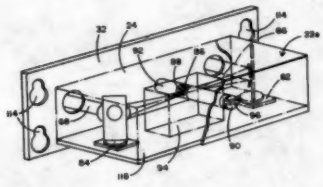
(e) means for providing a read out of the result computed by said digital processing circuit means.

4,640,617

SPECTROMETERS HAVING PURGE RETENTION DURING SAMPLE LOADING

Norman S. Hughes, San Clemente, and Walter M. Doyle, Laguna Beach, both of Calif., assignors to Laser Precision Corporation, Utica, N.Y.

Filed Feb. 28, 1985, Ser. No. 707,022
Int. Cl.[4] G01N *21/13*
U.S. Cl. 356—326 20 Claims



1. In a spectrometer having a wall-enclosed body space, a readily accessible wall-enclosed sample space wherein sample illumination occurs, and means for maintaining a non-atmospheric gas purge in both of the enclosed spaces, purge retention apparatus which avoids substantial purge loss during sample insertion into, and removal from, the sample space comprising:

a hollow guiding member which extends from the exterior into the interior of the sample space beyond the sample-illuminating position and which is secured in position; and

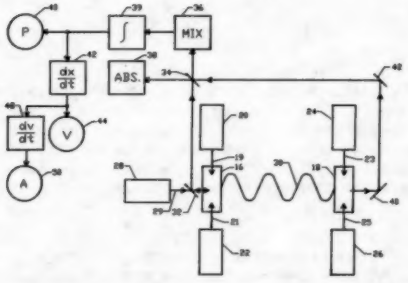
a sample-carrying member which is insertable into the interior of the hollow guiding member to advance the sample toward the sample-illuminating position, and which has a close exterior fit into the guiding member, and a generally closed interior construction, in order to substantially block flow of atmosphere into the gas purged interior of the sample and spectrometer spaces.

4,640,618

PHASE CONJUGATE RELATIVE POSITION SENSOR

John M. Tracy; Pochi A. Yeh, both of Thousand Oaks, and Mohsen Khoshnevisan, Newbury Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 3, 1983, Ser. No. 548,585
Int. Cl.[4] G01J *3/36, 13/00, 15/00*
U.S. Cl. 356—345 15 Claims



1. A phase conjugate relative position sensor, comprising:

an optical resonator, including a pair of opposed phase conjugate reflectors;

a source of electromagnetic energy for initiating a standing electromagnetic wave in said resonator; and

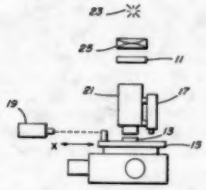
a detector for measuring relative movement between said resonator and said standing wave.

4,640,619

MICROLITHOGRAPHIC CALIBRATION SCHEME

Karl W. Edmark, III, Seattle, Wash., assignor to GCA Corporation, Andover, Mass.

Filed Mar. 13, 1985, Ser. No. 711,587
Int. Cl.[4] C01B *11/00*
U.S. Cl. 356—372 2 Claims



1. In a microlithographic system for optically projecting circuit patterns on semiconductor wafers in which alignment between successive exposures is provided by means of a microscope mounted to one side of the optical projection column, there being a metered stage for transporting a wafer between the microscope and the optical projection column, the method of correcting the the baseline vector between the projection column and the microscope, which method comprises:

placing, on said stage, a wafer with a light sensitive coating;

transporting said wafer to said column using an appropriate baseline vector for controlling movement of said stage;

exposing said wafer from a reticle which includes pattern reference markings to produce a visible latent image;

without removing said wafer from said stage, transporting said wafer to said microscope;

by observing, with said microscope, the latent image on said film, measuring the actual stage movement required to align the latent image of said fiducial markings on said wafer with the microscope; and

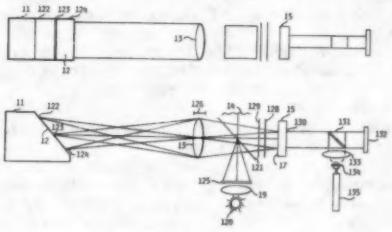
correcting said baseline vector based on said actual measurement.

4,640,620

ARRANGEMENT FOR RAPID DEPTH MEASUREMENT USING LENS FOCUSING

Richard Schmidt, Huntington, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,688
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 6 Claims



1. A method for simultaneously acquiring the three-dimensional co-ordinates relative to a sensor of at least two spatially separated points on a surface that may be devoid of detail, comprising the steps of: projecting a pattern of light with a projector from a light source; imaging reflected light from said pattern with a lens onto a light-sensitive detector array; focusing said image sharply by said lens within a narrow object plane; calibrating the image on said detector array for each

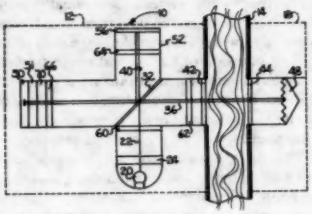
unique location of the said sharply focused narrow object plane; storing calibration data from said calibration in a memory; adjusting said object plane focal distance with said lens to intersect the surface of an object to be measured at an intersection; said intersection containing at least two spatially separated points; comparing each measured response to a threshold value; and conveying each response above threshold value into a three-dimensional measurement report from said calibration data.

4,640,621

TRANSMISSOMETER AND OPTICAL ELEMENTS THEREFOR

Thomas H. Rose, County of Wake, N.C., assignor to Eastern Technical Associates, Inc., Raleigh, N.C.

Filed Jun. 17, 1983, Ser. No. 505,535
Int. Cl.⁴ G01J *1/02*; G01N *21/00*
U.S. Cl. 356—434 **15 Claims**



1. An optical device comprising means for establishing a transmitted beam and a reference beam, means for subjecting the transmitted beam to a sample condition for attenuation thereby, detector means positioned for receiving each of said beams and generating a signal representative of a condition of the beams, and an electronic stepwise light attenuator located in the path of the reference beam, said attentutor having an optical field and comprising multiple liquid crystal display elements, each element being substantially uniformly distributed throughout the optical field and being independently energizable to place it in either a clear or an opaque condition, said elements being so positioned as to cooperate in their respective clear/opaque conditions to produce stepwise attenuation of the reference beam at predetermined and repeatable opacity steps, including multiple intermediate values between 0% and 100% opacity.

4,640,622

DISPERSION OF DRY POLYMERS INTO WATER

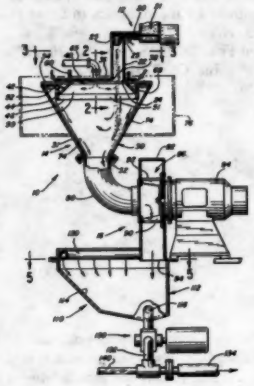
Edwin T. Sortwell, Wheaton, Ill., assignor to Diatec Polymers, Batavia, Ill.

Division of Ser. No. 588,793, Mar. 12, 1984, Pat. No. 4,603,156. This application Nov. 14, 1985, Ser. No. 798,190
Int. Cl.⁴ B01F *1/00*; B28C *7/04*
U.S. Cl. 366—76 **33 Claims**

1. An apparatus for rapidly dispersing particles of dry, water soluble polymer in water, comprising:

(a) means for contacting said particles with water and air, said contacting means comprising a chamber having interior surfaces, under conditions of flow of said air and water whereby at least a portion of said interior surfaces are wetted such that said particles are substantially completely wetted by said water without substantial contact of said particles with interior surfaces of said chamber which are not completely wetted, to form a mixture of water, polymer and entrained air;

(b) means for subjecting said mixture to conditions of instantaneous and momentary shear immediately after formation thereof whereby formation of agglomerates of particles is prevented, and existing agglomerates of particles are divided into individual particles without substantial molecular degradation or substantial reduction of particle size, to



form a dispersion of said polymer in said water, with entrained air; and,

(c) means for separating said dispersion from said air.

4,640,623

STIRRING MEMBER FOR LIQUID SUSPENSIONS IN SEALED SPRAY CONTAINERS

Göran Törnell, Lennart Torstensonsgatan 3, S-412 56 Göteborg, Sweden

PCT No. PCT/SE85/00069, § 371 Date Oct. 10, 1985, § 102(e) Date Oct. 10, 1985, PCT Pub. No. WO85/03457, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 12, 1985, Ser. No. 795,345
Claims priority, application Sweden, Feb. 13, 1984, 8400736
Int. Cl.⁴ B01F *13/00*; B65D *83/14*
U.S. Cl. 336—342 **3 Claims**

1. An improved stirring member for a liquid suspension in a sealed spray container, said stirring member being in the form of an essentially spherical body, the improvement comprising a plurality of ribs on said stirring member, said ribs extending along the jacket face of said stirring member, said ribs designed to increase the effects of the stirring activity when said stirring member passes through the liquid suspension in said container.

4,640,624

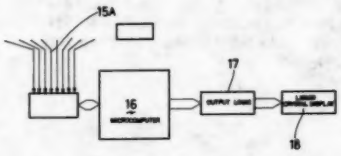
TIME COMPUTER AND DISPLAY DEVICE

Peter N. E. Pitt, 60 Wierda Road East, Wierda Valley, Sandton 2196, South Africa

Filed May 11, 1984, Ser. No. 609,328
Claims priority, application South Africa, May 16, 1983, 83/3467
Int. Cl.⁴ G04F *8/00*, *10/00*
U.S. Cl. 368—111 **6 Claims**

1. A time computer and display device comprising an electronic stopwatch having an operating switch and including

first time means for measuring and indicating cumulative time, second time means for measuring and indicating an element of time between the latest two actuations of the operating switch



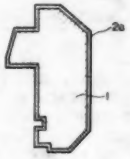
and a third time means for measuring and indicating the average element of time between all previous consecutive actuations of the operating switch.

4,640,625

EXTERNAL MEMBER FOR A WATCH

Hachiro Kushida, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,354
Claims priority, application Japan, Mar. 1, 1985, 60-40528
Int. Cl.[4] G04B *37/00*; B22F *1/00*
U.S. Cl. 368—280 **4 Claims**



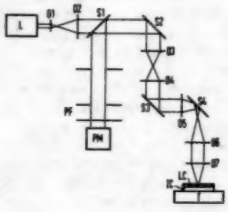
1. An external member for a watch comprising:
a body made of an aluminum alloy containing 0.5–2.5% of magnesium by weight, less than 0.01% of silicon by weight, and less than 0.01% of iron by weight; and
an anodic oxide film formed on the body.

4,640,626

METHOD AND APPARATUS FOR LOCALIZING WEAK POINTS WITHIN AN ELECTRICAL CIRCUIT

Ralf Schmid, Rosenfeld; Johann Otto, Bad Toelz; Daniela Bernklau, Riemerling, and Erwin Knapek, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,445
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433659
Int. Cl.[4] G01R *31/00*
U.S. Cl. 374—57 **14 Claims**



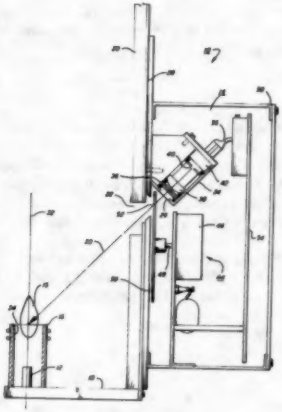
1. A method for localizing weak points within an integrated circuit, comprising the steps of:
covering a surface of the integrated circuit with a liquid crystal material;
heating the liquid crystal material to a temperature just below its clearing temperature wherein said liquid crystal material is in an ordered condition; then
radiating a three-dimensional region of the integrated circuit with polarized light whereby the radiation not reflected from the surface of the integrated circuit generates electron-hole pairs and thereby produces at least one current which causes a temperature rise at a weak point of the integrated circuit sufficient to induce conversion of the adjacent liquid crystal material from said ordered condition into an unordered condition; and
detecting the unordered condition by sensing the radiation reflected from the surface of the integrated circuit in the region of the weak point.

4,640,627

APPARATUS FOR MONITORING A PLASMA TORCH

David H. Tracy, Norwalk; Michael J. O'Brien, Bethel, and Walter Bohler, Wilton, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 26, 1983, Ser. No. 526,758
Int. Cl.[4] G01J *5/10*
U.S. Cl. 374—121 **10 Claims**

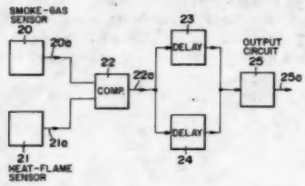


1. An apparatus for monitoring the temperature of a quartz tube used to partially surround a plasma flame issuing therefrom comprising; in combination:
electro-optical detector means remote from said quartz tube for producing an electrical signal whose amplitude is a function of the temperature of the quartz tube, said electro-optical detector means being disposed to receive infrared radiation from at least part of the exterior surface of the quartz tube and at least part of the interior surface of the tube; and
threshold means responsive to said electrical signal being above an upper threshold level indicative of a temperature approaching the melting point of quartz to produce a signal to turn off the plasma flame issuing from the quartz tube.

4,640,628
COMPOSITE FIRE SENSOR

Hiroshi Seki, 2265 Kamihongo, Matsudo-shi, Chiba-ken, and Ryuichiro Katsishi, 108-13, Ishiharada-machi, Kashihara-shi, Nara-ken, both of Japan

Filed Jul. 11, 1985, Ser. No. 753,987
Claims priority, application Japan, Jul. 11, 1984, 59-104650[U]; Sep. 10, 1984, 59-137114[U]; Oct. 20, 1984, 59-159000[U]; Oct. 20, 1984, 59-159013[U]
Int. Cl.[4] G01K 3/00
U.S. Cl. 374—141 6 Claims

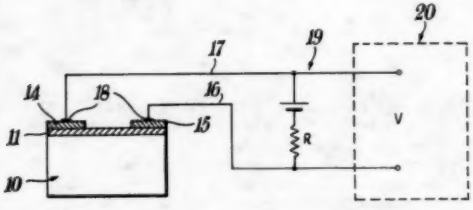


1. A composite fire sensor comprising a first sensor element sensitive to a change in incident infrared rays, a second sensor element having a variable electric conductivity according to gas absorption/desorption, said first sensor element being sensitive to heat and flame, said second sensor element being sensitive to smoke and gas and both producing outputs, at least one comparator means for combining the outputs of said first and second sensor elements, said at least one comparator means adapted to change its sensitivity to produce an alarm output in response to said outputs of said first and second sensor elements, and a delay circuit for delaying said alarn output of said at least one comparator means, wherein predetermined reference voltages along with the output of the first and second sensor elements are fed to said comparator means to produce said alarm output.

4,640,629
THERMISTOR-BOLOMETER AND METHOD FOR THE MANUFACTURE THEREOF

Bruno Antonini; Camillo Borghese; Arnaldo D'Amico; Paolo DeGasperis; Antonio Paoletti; Paolo Paroli; Giovanni Petrocco; Aldo Tucciarone, and Fernando Scarinci, all of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Jul. 12, 1983, Ser. No. 513,199
Claims priority, application Italy, Jul. 12, 1982, 48797 A/82
Int. Cl.[4] G01K 7/16
U.S. Cl. 374—178 10 Claims

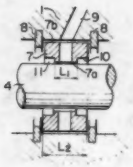


1. A thermistor-bolometer comprising a detector body (10) consisting of a low resistivity layer (11, 13) of a doped magnetic garnet, two contact elements (14, 15) of conductive material fastened on said low resistivity layer, said two contact elements being adapted to form ohmic contacts, and two conductor wires (16, 17) attached to said contact elements (14, 15) by means of contact pads (18) in order to connect said detector body to a biasing circuit and to a read-out circuit.

4,640,630
TURBOCHARGER BEARING ASSEMBLY

Masahiro Yoshioka, Ibaraki, and Haruyoshi Tsubouchi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 340,814
Claims priority, application Japan, Feb. 4, 1981, 56-14353
Int. Cl.[4] F16C 17/00, 19/55; F04B 17/00
U.S. Cl. 384—129 5 Claims

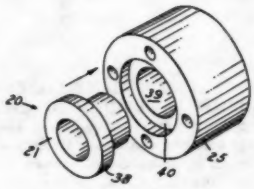


1. A supercharger bearing assembly comprising floating bushes for journalling a rotor shaft, the floating bushes being interposed between the rotor shaft and a housing assembly, characterized in that said floating bushes are each formed with an inner peripheral portion having an axial length less than an axial length of an outer peripheral portion thereof, and in that the axial length L_1 of the inner peripheral portion of each floating bush and the axial length L_2 of the outer peripheral portion thereof have values related to each other such that $0.4L_2 \leqq L_1 \leqq 0.58L_2$.

4,640,631
PLASTIC BEARING AND ONE PIECE HOUSING ASSEMBLY

James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

Continuation of Ser. No. 612,306, May 21, 1984, Pat. No. 4,586,831. This application Dec. 24, 1985, Ser. No. 813,313
Int. Cl.[4] F16C 33/20, 25/02, 35/02
U.S. Cl. 384—297 1 Claim



1. The combination of a bearing and a supporting surface to which the bearing is secured comprising:

a unitary block of plastic material having first and second sides, said block having a bearing bore centrally located and extending from the first side to the second side, and an outer surface coaxial with said bearing bore and having first and second portions, said first portion being a cylindrical surface extending from said first side to an intermediate point between said first and second sides, said second portion being a cylindrical surface extending from said second side towards said first side to said intermediate point and having a diameter smaller than the diameter of said first portion;

a housing formed of a rigid material and defining an inner space for receiving said block and having first and second axially aligned cylindrical openings, said first cylindrical opening extending from a first side of said housing to an intermediate point between said first side and a second side of said housing, said second cylindrical opening extending from said second side to said intermediate point,

said first cylindrical opening being sized to receive said first portion of said block and said second cylindrical opening being sized to receive said second portion of said block; and

said housing including a plurality of fastener holes spaced radially outwardly from said first and second cylindrical openings and being spaced about said openings, said plurality of fastener bores each being adapted to receive a fastener for mounting said housing on the supporting surface with the bearing bore of the block of plastic material extending perpendicularly to the supporting surface, said first side of said housing being abutted against said supporting surface, wherein the colocation of the housing and the supporting surface being the sole means for locating the block in the housing.

4,640,632

ARRANGEMENT FOR THE AXIAL POSITIONING AND HOLDING OF A MACHINE PART IN A THIN WALL SLEEVE OR THE LIKE

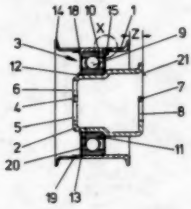
Manfred Brandenstein, Eussenheim; Hermann Hetterich, Heidenfeld, and Peter Horling, Mainberg, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,756

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 8112196[U]

Int. Cl.⁴ F16C *43/04, 13/02, 35/06*

U.S. Cl. 384—537 **9 Claims**



1. In an arrangement for axially positioning and holding a machine element in a thin wall sleeve having a bore therethrough the improvement wherein the sleeve material is radially inwardly deformed at several circumferential positions of the sleeve to form radially inwardly directed projections each having a rectilinear end surface toward the machine element extending in a radial plane and formed by radial deformation with a tool in said bore, for axially positioning and holding the sleeve and machine element with respect to one another, whereby said rectilinear surfaces are formed without additional processing of the sleeve.

4,640,633

HIGH-SPEED WIRE PRINT HEAD WITH WIRE PRINT POSITION SHIFT APPARATUS

Donald G. Hebert, San Ramon, Calif., assignor to DH Technology, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 592,400, Mar. 22, 1984, abandoned. This application Mar. 15, 1985, Ser. No. 710,633

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **54 Claims**

1. A wire print head assembly comprising:

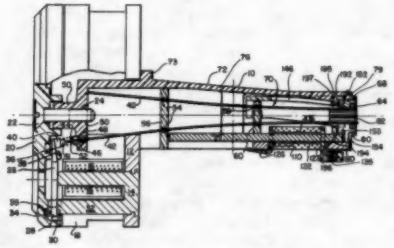
a plurality of wire print means having drive end portions mounted in a circular array and print end portions mounted in at least one linear array for printing characters composed of a series of adjacent circular dots;

wire actuating armature means and associated electromagnetic means mounted in a circular array in operative association with said drive end portions of said wire print means for actuating said wire print means in a longitudinal direction between a retracted non-print positon and an extended print position;

elongated wire housing means for receiving said wire print means and being made of one piece of molded plastic material, and having a rear end portion located in fixedly mounted juxtaposition to said electromagnetic means and said wire actuating armature means for receiving said drive end portions of said wire print means, and having a front end portion for receiving said print end portions of said wire print means;

wire bearing plate means having a plurality of wire bearing hole means arranged in at least one linear array of bearing holes for receiving and axially slidably supporting said print end portions of said wire print means;

shiftable bearing plate support means made of one piece of molded plastic material for fixedly mounting and suppoting said wire bearing plate means and being mounted within said wire housing means for selective transverse shifting movement relative to said longitudinal direction of movement of said wire print means between a first unshifted print position and a second transversely shifted print position;



support and guide means including slidably engageable side wall portions of said wire housing means and side wall portions of said shiftable bearing plate support means for slidably supporting said shiftable bearing plate support means in said front end portion of said wire housing means for movement between said first unshifted print position and said second transversely shifted print position;

rigid non-flexible wire shift armature plate means pivotally mounted in said wire housing means for pivotal movement therein by pivotal displacement thereof between a non-shift position and a shift position, and being operatively associated with said shiftable bearing plate support means for causing transverse shifting movement of said shiftable bearing plate support means between said first unshifted print position and said second transversely shifted print position; and

electrically energizable magnetic means mounted in said wire housing means in juxtaposition to said wire shift armature plate means for causing pivotal movement of said wire shift armature plate means between said non-shift position and said shift position to selectively effect movement of said shiftable bearing plate support means between said first unshifted print position and said second transversely shifted shift print position.

4,640,634
PRINTER WITH IMPROVED CARRIAGE AND CHARACTER WHEEL DRIVING MEANS

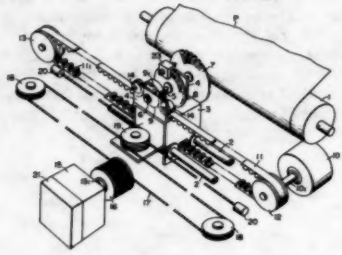
Toshiaki Ozawa, Tokyo; Yasuaki Yamada, Funabashi, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 525,802, Aug. 24, 1983, abandoned, which is a continuation of Ser. No. 280,098, Jul. 2, 1981, abandoned, which is a continuation of Ser. No. 70,985, Aug. 30, 1979, abandoned. This application Mar. 12, 1985, Ser. No. 710,530

Claims priority, application Japan, Sep. 5, 1978, 53-108054; Sep. 5, 1978, 53-108055

Int. Cl.[4] B41J *23/00, 1/30*

U.S. Cl. 400—144.2 11 Claims



1. A printer provided with a carriage movable parallel with an axis of a platen for feeding a recording medium, comprising:
- a shaft rotatably mounted on the carriage;
- a character wheel fixed on said shaft;
- a pulley fixed on said shaft;
- first braking means for stopping rotation of said shaft at a first state thereof and allowing the rotation of said shaft at a second state thereof, said first braking means including a drum brake;
- transmission means for transmitting driving power from a motor to said pulley;
- second braking means for stopping movement of said carriage at a first state thereof and allowing the movement of said carriage at a second state thereof; and
- control means for alternately placing said first braking means and second braking means into their first states.

4. A printer provided with a carriage movable parallel with an axis of a platen for feeding a recording medium, comprising:
- a shaft rotatably mounted on the carriage;
- a character wheel fixed on said shaft;
- a pulley fixed on said shaft;
- a motor for driving said pulley;
- transmission means for transmitting driving power from said motor to said pulley;
- first stopping means for stopping movement of said carriage to allow said motor to drive said character wheel; and
- second stopping means for stopping rotation of said shaft to allow said motor to drive said carriage, said second stopping means including brake means which is actuated by a plunger mounted on a member other than said carriage.

4,640,635
METHOD FOR INHIBITING PRINTING DURING RIBBON REVERSAL

Toshihiko Nakai, and Masahiko Kaneko, both of Saitama, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

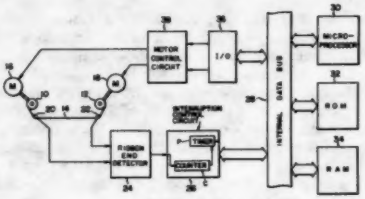
Filed Dec. 20, 1984, Ser. No. 684,123

Claims priority, application Japan, Dec. 28, 1983, 58-248888

Int. Cl.[4] B41J *29/70*

U.S. Cl. 400—664 2 Claims

1. A method of feeding an ink ribbon for a printer in which the ink ribbon is frequently used for imprinting action by the reversal of feeding at the ribbon ends comprising suppressing the imprinting action of the printer for a predetermined time at



the end of reversal of feeding at the ribbon ends and changing the suppression time at every reversal of feeding.

4,640,636
POWDER STICK WITH SHRINK FILM SHEATHING

Hans J. Hofmann, Nürnberg, Fed. Rep. of Germany, assignor to Schwan-Stabilo Schwanhäusser GmbH & Co., Nürnberg, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 712,641

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 8504263[U]

Int. Cl.[4] A45D *40/00, 40/20*

U.S. Cl. 401—96 6 Claims

1. A powder stick for a cosmetic pencil, including a lateral sheathing of a shrink film consisting essentially of hard PVC having a modulus of elasticity of from about 2400 to 3000 N/mm^2 (in accordance with DIN 53457), with a thickness of from 50 to 200 μm.

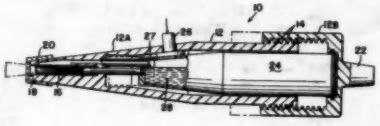
4,640,637
APPARATUS FOR DISPENSING AND APPLYING NAIL POLISH

Marilyn P. Winthrop, 54 Magnolia Hill, West Hartford, Conn. 06117

Filed May 21, 1984, Ser. No. 612,081

Int. Cl.[4] A46B *11/04*

U.S. Cl. 401—101 9 Claims



1. Apparatus for dispensing and applying nail polish, which comprises:
- an elongated, hollow housing having an opening at one axial extremity;
- a brush having a plurality of bristles, said bristle having a first end and a second end which is a free end, said brush being mounted for axial movement between a first position inside said housing and a second position;

means for axially translating said brush between said first position within said housing and a second position wherein at least a portion of said brush extends out of said housing;

a reservoir for nail polish disposed within said housing; and

means for discharging nail polish from said reservoir onto said brush comprising a passageway extending between said reservoir and said free end of said bristles said means for discharging comprises a button which is movable between a first position in which said button is positioned to deform and reduce the volume of said reservoir and a second position in which said button does not deform and reduce the volume of said reservoir.

4,640,638

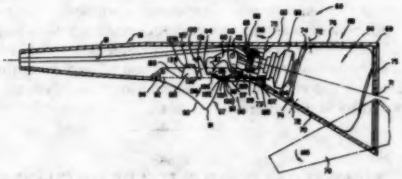
CLEANING SYSTEM

David J. Bokmiller, and Samuel C. Heck, both of San Antonio, Tex., assignors to Sani-Fresh International, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 478,516, Mar. 24, 1983, Pat. No. 4,534,669. This application Mar. 23, 1984, Ser. No. 592,945

Int. Cl.⁴ A46B *11/02;* **A47L** *13/22, 13/17*

U.S. Cl. 401—145 **5 Claims**



1. A cleaning wand comprising:

an elongate housing having a cavity therein adapted to receive a cleaning fluid cartridge;

a surface cleaning means connected to said housing; a finger trigger pivotally connected to said housing within a slot in said housing; a movable linkage pumping mechanism within said cavity of said housing comprising a pivotal swing arm and an end cap member, said pivotal swing arm being in operative engagement with said end cap member and having a camming surface for sliding engagement with an inner surface of said trigger, whereby upon depression of said trigger said camming surface slides on said inner surface of said trigger and said swing arm pivots, thereby causing said end cap member to move toward a rear of said housing opposite said surface cleaning means, said end cap member being adapted to compress said cartridge upon movement of said end cap member toward said rear of said housing, said linkage pumping mechanism thereby permitting translation of movement of said pivotal trigger in a first direction upon depression thereof into movement of said end cap member in a second direction generally transverse to said direction of movement of said trigger; and

a tube disposed within said cavity of said housing for permitting fluid communication between said cartridge and a discharge passage in said housing, said linkage pumping mechanism being adapted to effectuate compression of said cartridge to discharge cleaning fluid from said cartridge through said tube and outward from said housing through said discharge passage upon depression of said trigger.

4,640,639

PRINTED CIRCUIT BOARD HOLDING APPLIANCE

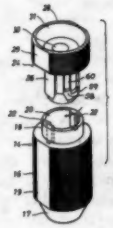
Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Dec. 6, 1984, Ser. No. 679,071

Claims priority, application Japan, Feb. 13, 1984, 59-19492[U]

Int. Cl.⁴ F16B *1/00;* **H01B** *17/00*

U.S. Cl. 403—24 **7 Claims**



1. A printed circuit board holding appliance comprising:

a spacing holding member having a shaft-like protrusion extending from an upper end thereof and a fitting hole extending through said holding member and protrusion parallel to the longitudinal axis thereof; and

a fitting member having a shaft portion fittable in said fitting hole and a flange portion formed on the upper end of said shaft portion, and an insertion hole extending through said fitting member parallel to a longitudinal axis thereof, wherein said protrusion of said spacing holding member is fittable in a mounting hole formed in a printed circuit board, and a lower end portion of the spacing holding member is formed in a downwardly tapered shape.

4,640,640

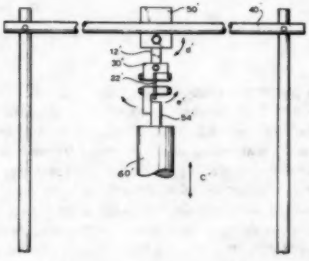
SUBSTANTIALLY FRICTIONLESS UNIVERSAL CONNECTING DEVICE

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,274

Int. Cl.⁴ F16D *3/00;* **F16C** *11/06*

U.S. Cl. 403—57 **8 Claims**



1. Apparatus for universal swivel linear mounting of an actuated object comprising:

a fixed mounting means for unencumbered support of linear actuation of said actuated object, said mounting means including a rod fixed at a certain height and a bracket mounted on said rod for connection to one end of a first elongated planar blade member;

a combination extension/universal swivel connection which provides substantially frictionless universal swivel movement between said mounting means and said actuated

object, said combination extension/universal swivel connection comprising;

a first elongated flexible planar blade member having two ends, one of said ends connected to said bracket and the other of said ends extended from said bracket for interconnection;

a second elongated flexible planar blade member having two ends, one of said ends connected to an actuated member and the other of said ends extended from said actuated member for interconnection, and

an interconnecting means to which said other ends of said first and second flexible blade members are interconnected with the plane of each of said elongated planar blade members perpendicular to each other, said first and second elongated flexible planar blade members and said interconnecting means linearly arranged between said mounting means and said actuated member whereby said combination forms part of a connecting extension between said mounting means and said actuated member, and

wherein said actuated member extends between said combination extension/universal swivel connection and said actuated object, said actuated member being connected to both said one end of said second elongated flexible planar blade member and said actuated object,

whereby motion imparted by said actuated object is universally accommodated by bending of said first and second flexible blade members in the substantial absence of friction.

4,640,641

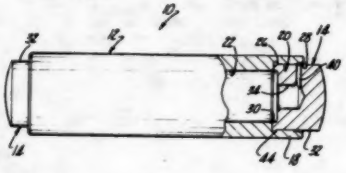
PISTON PIN CONSTRUCTION AND METHOD FOR FORMING SAME

Thomas C. Edelmayer, Mobile, Ala., assignor to Teledyne Continental Motors, Mobile, Ala.

Continuation of Ser. No. 634,365, Jul. 25, 1984, abandoned. This application May 12, 1986, Ser. No. 863,816

Int. Cl.⁴ F16D *1/12*; B21D *39/00*

U.S. Cl. 403—150 **6 Claims**



1. A piston pin comprising:

a tubular body having a pair of axial ends, an inner peripheral wall at each of said axial ends, and a radially outwardly extending annular recess formed in each of said inner peripheral walls, each of said recesses being spaced axially inwardly of its associated body axial end,

a pair of substantially cylindrical end caps dimensioned correspondingly to said inner peripheral walls so as to be receivable in said axial ends of said tubular body, and

means for extruding a portion of said end caps into said recesses when said end caps are forcibly inserted into said axial ends of said tubular body

wherein at least one of said caps includes an axial bore and a radial bore which intersect at one end, the other end of said axial bore being open to said tubular body and the other end of said radial bore being open exteriorly of said tubular body wherein said inner peripheral walls each include an outwardly tapered portion at its said axial end, and wherein said radial bore communicates with said outwardly tapered portion.

4,640,642

BENDABLE ELBOW CONNECTOR

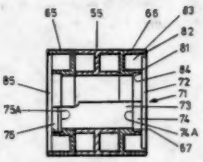
Robert Magid, 188 Goldhurst Terrace, West Hampstead, London NW6, England, and John Choong, London, England, assignors to Robert Magid, London, England

Filed Jan. 22, 1985, Ser. No. 693,666

Claims priority, application United Kingdom, Jan. 27, 1984, 8402150

Int. Cl.⁴ F16C *11/06*

U.S. Cl. 403—157 **9 Claims**



1. A bendable elbow connector comprising a first element having one end provided with a single first eye, a second element having one end provided with two coaxial second eyes axially spaced to receive between them said single eye, and a pivot pin insertable through all said three eyes, when the latter are coaxially aligned, to thereby join said two elements together, wherein said pivot pin consists of two parts insertable through said eyes, each said part having a first end provided with a first engagement means and an opposite second end provided with a resilient second engagement means, and each said second eye having at its axially outer side a third engagement means, whereby on full insertion of said parts through said eyes said parts at each end and said second eyes are interlocked by said engagement means.

4,640,643

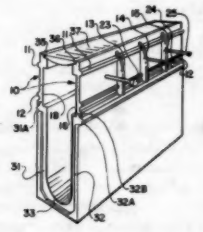
SIDEWALL EXTENSION FOR DRAIN CHANNEL SYSTEM AND METHOD FOR EXTENDING THE CONTINUOUS SLOPE OF A DRAINAGE CHANNEL SYSTEM

Barry C. Williams, Statesville, N.C., assignor to Polydrain, Inc., Troutman, N.C.

Filed Jun. 19, 1985, Ser. No. 746,258

Int. Cl.⁴ E01F *5/00*

U.S. Cl. 404—4 **23 Claims**



1. In a drainage channel system of the type characterized by a plurality of drainage channel segments of progressively greater length adapted to be interlocked end-to-end to provide a below grade gravity feed sloping drainage run of a predetermined length, each of said channel segments comprising a pair of opposing, spaced-apart side walls, a bottom wall connecting said side walls adjacent one end thereof, and a top opening opposite said bottom wall, said side walls and said bottom wall defining a fluid carrying space therebetween and said top opening defining a fluid entrance adapted to receive a grate;

the combination therewith of a side wall extension for being mounted on top of each of the side walls of the interlocked channel segments along at least a part of the length of the sloping run and effectively increasing the total depth of each said channel segment and increasing the length of a continuously and progressively sloping run of the drainage channel system, each of said side wall extensions comprising a substantially planar body mounted on top of one of the side walls of the channel segment and including means for laterally supporting said planar body in parallel upright relation to said channel segment by engagement with a supporting bed of concrete or the like and without engagement or cooperation with an opposing side wall extension.

4,640,644

METHOD AND APPARATUS FOR REMOVAL OF SURFACE MATERIAL

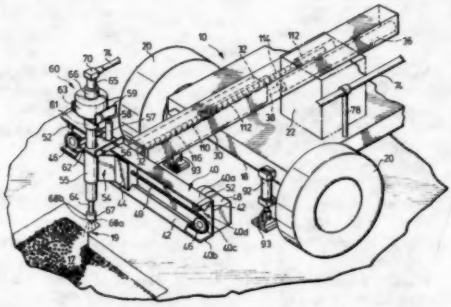
Ryszard J. Puchala, Scarborough, and Stephen J. Miko, Toronto, both of Canada, assignors to Indescor Hydrodynamics Inc., Concord, Canada

Filed Apr. 12, 1985, Ser. No. 722,454

Claims priority, application Canada, Apr. 16, 1984, 452,066

Int. Cl.[4] E01C *23/12*; E21C *25/60*

U.S. Cl. 404—75 **14 Claims**



1. Apparatus for removing material from a surface, for use in association with a source of water at a pressure within the range of about 10,000 to 25,000 psi, the apparatus comprising;

a carriage vehicle means;

extendable arm means mounted on the vehicle means and defining a free end, said arm means being movable along a linear path away from and towards said vehicle means and defining a longitudinal axis lying in a predetermined plane;

a transverse nozzle support member attached to the free end of said arm means;

transverse nozzle movement means on said support member;

rotatable nozzle means movably attached to said support member, said nozzle means being movable to and fro along a linear transverse path defining a transverse axis lying in a predetermined plane, and being operable to direct a water jet at an angle onto said surface over a circular zone of predetermined width;

hose means connecting said source of water to said nozzle means;

motor means attached to said nozzle means operable to rotate said nozzle means, and,

power operated means attached to said arm means operable to extend and retract said arm means relative to said vehicle means along said longitudinal axis by increments equal to said predetermined width of said circular zone of said jet.

13. A method for removing material from a surface comprising the steps of pressurizing water to a pressure within the range of 10,000 to 25,000 psi;

at a first location passing said pressurized water through nozzle means supported on a movable carriage;

directing at least two separate water jets from said nozzle means, oriented at two different angles relative to a vertical axis;

rotating said nozzle means whereby to establish a circular zone of predetermined width for said water jets on said surface to establish turbulent water flow thereon to break up material and to wash away loose material;

traversing said nozzle means relative to said carriage along a transverse linear axis from one side to another establishing a transverse path of said jets having a width equal to said predetermined width whereby to define a scan and stopping said traversing of said nozzle means;

moving said nozzle means relative to said carriage along a second linear axis perpendicular to said first axis at the completion of at least one said scan by an increment equal to said predetermined width, and stopping said movement;

again tranversing said nozzle means to define another scan parallel to and alongside said first mentioned scan;

repeating said traversing and incremental movement a predetermined number of times, and then stopping same;

moving said carriage and stopping at second location, and,

repeating said steps, in sequence, whereby to progressively remove said material from said surface.

4,640,645

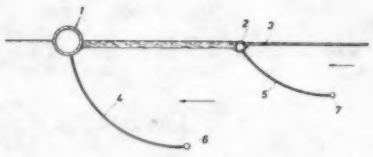
CONTAINMENT BOOM SYSTEM

Wayne F. Simpson, Anchorage, AK.; Ray R. Ayers, and Robert W. Patterson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 23, 1985, Ser. No. 779,137

Int. Cl.[4] E02B *15/04*

U.S. Cl. 405—63 **4 Claims**



1. A method for containing a floating liquid pollutant upon a water surface, comprising:

providing at least two spaced-apart booms, one boom having a lower above-water profile than other boom;

allowing pollutant to splash over the lower profile boom and be captured in a containment area between the two booms;

providing the lower profile boom with a skirt having sufficient draft to create a low pressure region between the two booms; and

providing the higher profile boom with a skirt having sufficient draft to prevent pollutant from escaping thereunder.

4,640,646

APPARATUS FOR THE CONSTRUCTION OF TUNNELS AND SHAFTS

Volker Hentschel, Dorsten-Wulfen, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft vorm Gebr Helfmann, Essen, Fed. Rep. of Germany

Filed Jan. 10, 1985, Ser. No. 690,163

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401012

Int. Cl.[4] E21D *9/06, 9/08*

U.S. Cl. 405—141 **8 Claims**

1. A tunneling apparatus comprising:

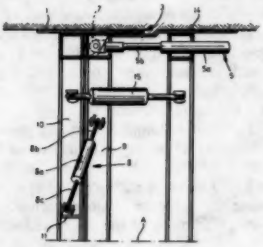
a shield structure including a leading shield, a follower shield, and a joint connection for joining said leading shield and said follower shield;

a pressure ring mounted in said follower shield and at least one means for receiving thrust forces mounted in said leading shield;

a roll correction device mounted in said shield structure and including a roll correction ring in said leading shield and

which can rotate with respect to the leading shield and bearing upon said means for receiving thrust forces;

a plurality of advancing piston/cylinder assemblies, distributed about the shield circumference and movably connected to said pressure ring and to said roll correction ring but acting upon said leading shield only through said roll correction ring; and



a plurality of adjusting piston/cylinder assemblies mounted at said roll correction device, said adjusting piston/cylinder assemblies being oriented generally secantially and being braced between said means for receiving thrust forces and said roll correction ring for controlling the orientations of said advancing piston/cylinder assemblies with respect to said leading shield and said follower shield.

4,640,647

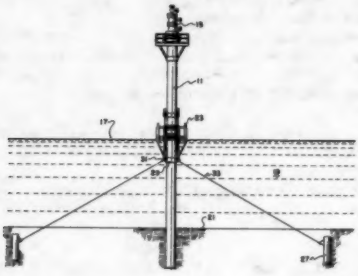
OFFSHORE WELL APPARATUS AND METHOD

Christon R. Blair, Spring, Tex., and Kenneth B. Parker, Anchorage, Ak., assignors to Atlantic Richfield Company, Plano, Tex.

Filed Apr. 12, 1985, Ser. No. 722,853

Int. Cl.⁴ E02B *17/00*

U.S. Cl. 405—224 **10 Claims**



1. In a offshore well in a first depth of water above a bottom, the well having:

a. a main casing penetrating subterranean formations below the bottom and protruding upwardly through the first depth of water and extending above the surface of the water;

b. a wellhead affixed to said main casing; said wellhead having valves connected with tubing penetrating interiorly of said main casing to subsurface completion zones in said well and having external means for connecting with surface accessories for delivering at least one fluid from said well; and

c. a boat landing disposed about said main casing and connected with said well;

the improvement comprising:

d. a plurality of at least three anchor piles driven at respective azimuths and distances about the well for anchoring said protruding main casing against lateral forces;

e. a plurality of clamping means movably connected with said main casing so as to be movable longitudinally of said casing means and disposed a predetermined distance apart and including an upper clamping means and a cable clamp movably connected with said main casing a predetermined distance below said upper clamping means and below the surface of the water and supporting a plurality of at least three pulleys adapted to receive respective cables therethrough; said cable clamp being rigidly disposed said predetermined distance below said upper clamping means and said surface to ensure sufficient depth for boats to maneuver about said boat landing;

f. said plurality of at least three cables connected respectively with respect to said anchor piles, passed through respective said pulleys onto said cable clamps; said cables begin pulled taut and connected with said boat landing and well so as to support said well against said lateral forces such that boats can maneuver about said landing without becoming entangled in said cables or having their props fouled by said cables because of said predetermined distance of vertical clearance before said cables traverse outwardly at respective angles to said respective anchor piles.

4,640,648

INDUSTRIAL FLOOR AND CONSTRUCTION METHOD

Xavier P. Destree, and Angelo A. Lazzari, both of Brussels, Belgium, assignors to Eurosteel S.A., Brussells, Belgium

PCT No. PCT/BE84/00006, § 371 Date Nov. 2, 1984, § 102(e) Date Nov. 2, 1984, PCT Pub. No. WO84/03530, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 7, 1984, Ser. No. 678,552

Claims priority, application Belgium, Mar. 10, 1983, 0/210291

Int. Cl.⁴ E02D *27/08, 27/26;* E04B *5/32*

U.S. Cl. 405—229 **7 Claims**

1. A process for making a totally independent and continuous slab of fiber-reinforced concrete devoid of seams, which comprises the steps of:

providing a foundation course;

compacting said foundation course to a k value of Westergaard of at least 5 kg/cm^3;

leveling said foundation course with a tolerance of at most ±1 cm with respect to a reference level;

placing a plastic sheet on said foundation course;

placing a compressible mattress adjacent fixed boundaries which are to limit or traverse said slab so as to separate said slab from said fixed boundaries;

placing complementary reinforcements adjacent said fixed boundaries;

casting on said foundation course, adjacent said fixed boundaries, a limited shrinkage concrete reinforced with fibers;

allowing said concrete to set.

4,640,649

METHOD AND APPARATUS FOR FORMING AN UNDERGROUND SOLIDIFICATION STRUCTURE

Wataru Nakanishi, Machida, Japan, assignor to N.I.T. Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,143

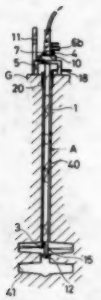
Claims priority, application United Kingdom, May 9, 1984, 8411774

Int. Cl.⁴ E02D *3/10*

U.S. Cl. 405—237 **8 Claims**

1. A method for forming an underground solidification structure comprising the steps of inserting an insertion tube assembly including a reverse suction tube, a high pressure jet spouting tube and a solidification material spouting tube to a predetermined depth into an area of the underground where a solidification structure is to be formed, filling a cavity formed in said underground area by the insertion of said insertion tube

assembly therein with bentonite liquid or the like, recycling said bentonite between said cavity and an external device, spouting digging material as a high pressure jet laterally through said high pressure jet spouting tube against the wall of said cavity to dig down the cavity while rotating the tube assembly continuously and alternately in one and the other directions covering a predetermined angular distance, sucking



the soil displaced from the wall of said cavity upwardly through said reverse suction tube onto the ground with the soil entrained in the bentonite liquid and at the same time monitoring the conditions of said dug cavity by a monitor on said insertion tube assembly and spouting solidification material through said solidification material spouting tube into said cavity to thereby reinforce the underground.

4,640,650

HYDRAULICALLY OPERATED UNIT FOR ROOF SUPPORT

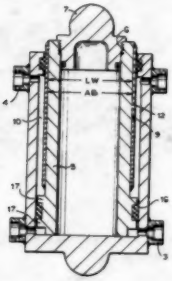
Manfred Koppers, Duisburg; Karlheinz Bohnes, Bochum, and Friedel Amling, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co. Kg, Bochum, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 521,735

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320759

Int. Cl.[4] E21D *15/50*

U.S. Cl. 405—290 **14 Claims**



1. A hydraulically operated unit, particularly a prop for a support in underground operations, comprising an outer tubular element; an inner element movable relative to said outer element and having a predetermined outer diameter and a flow limit; and a thin-walled tubular jacket pressed on said inner element and having an inner diameter which is determined with such an undersize relative to said outer diameter of said inner element that said tubular jacket is clamped on said inner element with exceeding of said flow limit of said inner element and only in a plastic expansion condition of said tubular jacket which plastic expansion condition of said tubular jacket exceeds an elastic deformation region of said tubular jacket with a reliable distance and with a sufficient residual springing part of said tubular jacket.

4,640,651

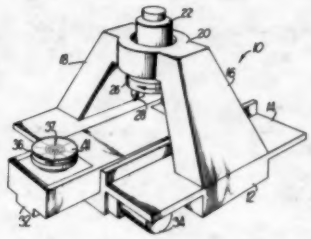
COMPUTER MEMORY DISC AND METHOD FOR MACHINING SAME

Robert C. Runyon, Dunwoody, Ga., assignor to Substrate Systems, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 680,863, Dec. 12, 1984. This application Dec. 28, 1984, Ser. No. 685,612

Int. Cl.[4] B23C *3/13*

U.S. Cl. 409—132 **8 Claims**



1. A method for machining a thin workpiece with a fly cutter having a periphery with a tool mounted thereon to avoid stress warping of the workpiece wherein the workpiece has a surface and the tool engages the workpiece and produces machining lines on the surface of the workpiece, which machining lines result in corresponding lines of stress within the workpiece, the method comprising the steps of:

(a) rotating the fly cutter at an angular velocity, which angular velocity produces a corresponding linear velocity for the tool;

(b) rotating the workpiece at an angular velocity; and

(c) feeding the rotating workpiece past the rotating fly cutter at a transverse feed rate, which feed rate is at least an order of magnitude less than the linear velocity of the tool.

4,640,652

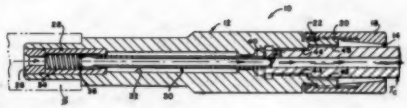
COOLANT DELIVERY SYSTEM

Jeremias C. Rivera, Jr., Chicago, Ill., assignor to Scully-Jones Corp., Chicago, Ill.

Filed Jun. 30, 1986, Ser. No. 880,043

Int. Cl.[4] B23G *1/46*; B23B *51/04*

U.S. Cl. 409—136 **12 Claims**



1. A tap extension for connecting a cutting tap in rotatably driven relation with an associated spindle having coolant supply means, said tap extension comprising:

a shank portion having a first end for connection to said spindle in driven relation therewith;

locking means at a second end of said shank portion opposite said first end, said locking means being adapted to receive and releasably retain said tap in rotatably driven relation with said shank portion;

coolant passage means extending within and axially of said shank portion, said passage means being joined in fluid

communication with said coolant supply means when said extension is connected to said spindle whereby coolant is delivered to said passage means; and

valve means operatively associated with said passage means for controlling flow of coolant from said passage means, whereby (1) in a first mode of operation, coolant is delivered from said passage means to an axial coolant bore defined by a first tap, and (2) in a second mode of operation, coolant is delivered from said valve means to between flutes of a second, solid tap.

4,640,653

INTEGRAL SPRING FLEXURE FOR USE WITH HIGH SPEED ROTATING SHAFTS

Everett H. Schartzman, 2751 Toledo St., #309, Torrance, Calif. 90503

Filed Jul. 30, 1984, Ser. No. 635,716
Int. Cl.[4] B23Q *3/12*
U.S. Cl. 409—233 **10 Claims**

1. A high speed spindle having an accurate axis of rotation which does not deviate during operation thereof comprising:

a housing;

a spindle shaft positioned in said housing;

bearing means positioned within said housing a supporting said spindle shaft for rotation;

rotatable collet means cooperating with said rotatable spindle shaft for releasably holding a tool member,

said spindle shaft including rotatable drawbar means movable axially relative to said spindle to effect release of said collet means in one position and engagement in another position;

rotatable non-helical spring means cooperating with said drawbar means to bias the latter in the engaged position of said collet means,

said non-helical spring means being positioned in concentric relation to said drawbar means,

means interconnecting said non-helical spring means and said drawbar means, and

said non-helical spring means being an integral one-piece spring member including a plurality of spring elements integrally jointed together in which each spring element includes spaced upper and lower surfaces and being of a predetermined thickness and of a diameter which determines the stiffness and the stress level of each spring element in order to inhibit out-of-balance shifting of the true mass of the spring member with respect to the geometric axis of said spring member during rotation of said spindle assembly at high speeds.

4,640,654

ANCHOR

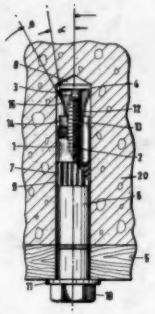
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3/Tumlingen; Jürgen Onasch, Bonn, and Manfred Haage, Herrenberg-Oberjesingen, all of Fed. Rep. of Germany, assignors to Artur Fischer, Waldachtal/Tumlingen, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,645

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420375

Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—55 **7 Claims**

1. An anchor for fastening in bore holes formed in support structures, comprising an expansion sleeve having a leading end; an expander body positioned at said leading end of said expansion sleeve and including a conical portion; a stay bolt having an abutment with gripping surfaces for applying a torque thereto, said bolt being inserted into said sleeve and engaged with said expander body for driving said expander body into said sleeve; and an intermediate sleeve positioned between said abutment and said expansion sleeve, said expander body further including a concavely-curved portion, said conical portion immediately tangentially merging at a greater



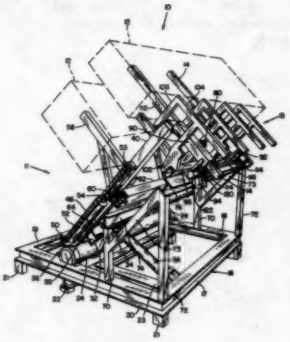
diameter thereof into said concavely-curved portion, said concavely-curved portion forming at a leading end of said expander body a tangent line which extends at an angle to a central axis of the anchor, said angle approximately corresponding to a double angle of inclination of said conical portion to said central axis.

4,640,655

CONTINUOUS FEEDING APPARATUS

Marvin A. Jacobsen, Winston, Oreg., assignor to Con-Vey/Keystone, Inc., Roseburg, Oreg.

Filed Apr. 12, 1985, Ser. No. 722,338
Int. Cl.[4] B65G *59/02, 59/08*
U.S. Cl. 414—119 **12 Claims**



12. An apparatus for continuously feeding tiers from successive tiered loads, comprising:

hoist means pivotally mounted for receiving a tiered first load and then pivoting to hoist the tiered first load upward along a load path from a path base;

tier-discharging means mounted for relative movement along the path toward the load as the load is hoisted and held stationary for engaging the first load and effecting discharge of successive tiers from the top of the load; and

load-accepting means disposed along the load path and insertable into the path for receiving and holding the first load from the hoist means and for maintaining engagement of the load with the tier-discharging means as the hoist

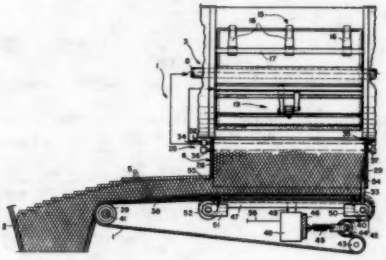
means lowers to receive a second load, the load-accepting means thereafter retractable from the path to allow engagement of the tier-discharging means with the second load.

4,640,656

DEVICE FOR SUPPLYING ROD-SHAPED ARTICLES, FOR EXAMPLE CIGARETTES, TO A PROCESSING MACHINE

Riccardo Mattei, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Aug. 2, 1985, Ser. No. 762,545
Claims priority, application Italy, Oct. 11, 1984, 3600 A/84
Int. Cl.[4] B65G *65/23*
U.S. Cl. 414—303 **6 Claims**



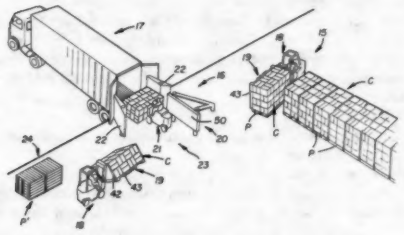
1. A device for supplying rod-shaped articles, for example cigarettes, to a processing machine, comprising means for supplying containers of these articles above a tank, retaining means associated with the containers and movable between a closed position and an open position of a discharge mouth of the containers, a conveyor forming the base of the tank for supplying a continuous flow of articles to the processing machine. means for displacing at least the portion of said conveyor under the tank with a reciprocating movement in a substantially vertical direction, and detection means for detecting the level of the articles in the tank and for controlling the displacement means.

4,640,657

CARTON LOADING METHOD AND SYSTEM

Robert W. Moore, 664 Melrose Dr., and Michael J. Azzopardi, 215 E. Romie La., both of Salinas, Calif. 93901

Filed Sep. 10, 1984, Ser. No. 649,221
Int. Cl.[4] B65G *57/28*
U.S. Cl. 414—347 **24 Claims**



14. A carton loading system comprising

a first station adapted to receive at least one pallet having a plurality of cartons stacked thereon,

a rotator lift truck having a rotator attachment rotatably mounted forwardly thereon for rotation about a longitudinal axis thereof, said rotator attachment including means for receiving, lifting, retaining and rotating said pallet and cartons thereon generally 90° from a first to a second upright position,

a second station adapted to receive said rotator lift truck,

a vertically disposed stationary stop plate means positioned transversely relative to the longitudinal axis of said rotator attachment and fixedly mounted at said second station for engaging and compressing all of said cartons simultaneously on said rotator attachment and

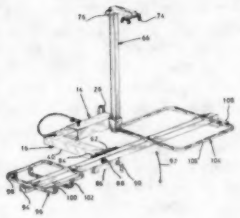
lift truck means for entering said second station transversely of the longitudinal axis of said rotator attachment and towards said cartons when they are retained in their second upright position on said rotator lift truck and for thereafter lifting said cartons directly from said rotator lift truck and loading said cartons into a cargo space of a transport vehicle.

4,640,658

DEMOUNTABLE CARRIER FOR MOUNTING ON VEHICLES

Grandville S. Webb, Jr., Rte. 1, Box 75, Harriman, Tenn. 37748

Filed Sep. 24, 1985, Ser. No. 779,665
Int. Cl.[4] B60R *9/06*
U.S. Cl. 414—462 **11 Claims**



1. A demountable carrier for attachment to a trailer hitch mounted upon a vehicle and having a flat tongue extending from such vehicle substantially parallel to ground, such tongue provided with an aperture, which comprises:

a hollow elongated socket member having a bore of a selected cross-section and being provided with at least one pair of aligned apertures in opposite surfaces oriented perpendicular to said bore, said socket member being provided with fastening means for passing through such aperture in such tongue to secure said socket member to such tongue in an orientation substantially perpendicular to a long axis of such tongue and parallel to such ground;

an L-shaped plug member having first and second legs substantially at right angles to each other, said first leg having a selected cross section and length to be closely received in said socket member, said second leg having a free end to support a carrier unit, said first leg provided with at least one aperture therethrough oriented perpendicularly to said first leg whereby said aperture in said first leg is aligned with said apertures in said socket member when said first leg is inserted in said socket member;

a removable pin for passing through selected aligned apertures in said first leg and said socket member;

wherein the number of apertures in said socket member and said first leg of said plug member is selected whereby said pin is receivable in aligned apertures when said second leg is either substantially vertically oriented or substantially horizontally oriented with respect to said ground; and

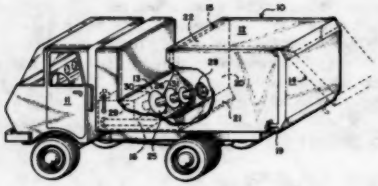
wherein said selected cross sections of said first leg of said plug and said bore of said socket member prevent rotation between said plug member and said socket member and permit said first leg to be inserted into said bore in said two orientations of said second leg substantially perpendicular to each other.

4,640,639

IMPELLER AND COMPACTION REFUSE COLLECTION SYSTEM

Hal Parks, 7323 W. Vogel Ave., Peoria, Ariz. 85345

Filed Dec. 20, 1984, Ser. No. 684,106
Int. Cl.[4] B65F 3/14
U.S. Cl. 414—503 7 Claims



1. A transportable container for collection, compaction and ejection of refuse comprising:

a. a refuse storage compartment having forward and rearward ends and a confined volume between opposing side walls and top and bottom walls, said reward end of the compartment being closed by an ejection door coupled to the compartment and including means for releasing the ejection door in respense to ejection of refuse from the compartment;

b. the forward end of the compartment being enclosed by a movable compacting blade having a fixed, upright orientation and adapted with means for activating lateral reciprocating movement of the blade in its fixed, upright orientation between a forward, noncompacting position and a rearward compacting position which is disposed with the confined volume of the compartment, said compaction blade including an opening therethrough for communicating through the forward end;

c. a hopper compartment positioned immediately forward of the forward end and having forward, rearward, side and floor walls adapted for receiving refuse to be dumped therein;

d. a refuse shredding device attached at the floor of the hopper compartment, said device having a receiving portion and a dispensing end, said despensing end being positioned at the opening in the compaction blade when said blade is in the rearward position to dispose shredded refuse therethrough into the storage compartment for compaction the compaction blade is attached to the rearward part of the hopper compartment forming a single hopper/compaction blade structure, said shredding device being permanently disposed in a fixed position in relation to the compaction blade with its dispensing end at the opening therethrough, the combined blade and hopper being subject to movement by the reciprocating means between the rearward and forward positions.

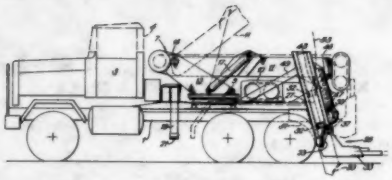
4,640,660

RECOVERY AND TOWING VEHICLE

Norman F. Watson, Chippings, England, assignor to EKA Group Ltd., London, England

Filed Feb. 15, 1985, Ser. No. 701,957
Claims priority, application United Kingdom, Feb. 20, 1984, 8404429
Int. Cl.[4] B60P 3/12
U.S. Cl. 414—563 12 Claims

1. A recovery vehicle comprising a chassis, two parallel arcuate slideways connected to said chassis and a supported lift towing boom having a mast which is slidably supported between and within said two parallel slideways and a boom connected to the mast extending generally normal to the mast so that as the mast is raised up between the arcuate slideways,



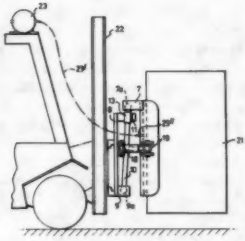
the free end of the boom will rise at a greater rate than the end connected to the mast.

4,640,661

VACUUM LIFT CLAMP DEVICE FOR HANDLING OF PAPER ROLLS

Rolf B. Rasmussen, Niels Hoegs vei 33C, N-2010 Strommen, Norway

PCT No. PCT/NO83/00027, § 371 Date Feb. 28, 1984, § 102(e) Date Feb. 28, 1984, PCT Pub. No. WO84/00154, PCT Pub. Date Jan. 19, 1984
Continuation-in-part of Ser. No. 394,803, Jul. 2, 1982, abandoned. This PCT application Jul. 4, 1983, Ser. No. 598,311
Int. Cl.[4] B66F 9/18
U.S. Cl. 414—619 11 Claims



1. A vacuum lift clamp device for handling at least one paper roll, for use in connection with a conventional lifting truck, comprising:

a frame member operatively connected to the truck,

a support member connected to the frame member,

a vacuum pad unit comprising a rigid curved central plate and two rigid curved, outer flap plates hingedly connected, one to each vertical edge of the said central plate, whereby movement of the flap plates about their said hinge connections to the central plate permits the vacuum pad to adapt to different diameter paper rolls, sealing means on the faces of said plates for forming an evacuatable vacuum tight area between the plates and the roll, after the plates have been placed against a roll, for holding the roll to the plates,

a bearing member connected to the upper rear part of said central plate,

a universal connection means between said support member and said bearing member for supporting the vertical forces exerted by the vacuum pad and by a roll held thereon, while permitting fore and aft tilting movement and limited turning movement, of the bearing member, and hence also the upper part of the vacuum pad, relative to said frame member, a force exerting balance arm operatively connected between said frame member and each of said flap plates, said balance arm engaging said flap plates at a height sufficiently below the height of the bearing member to exert a tilting forward torque effect on the paper

roll which tends to urge the lower part of the roll forwardly relative to the upper part of the roll located adjacent the bearing member, said balance arm having means for substantially increasing, in three stages, the horizontal forces which it exerts against said flap plates, the first and lowest force stage being attained by the rearward movement of the upper part of the roll, relative to the vacuum unit, upon forward movement of the truck against a roll, the second and medium force stage being attained by the forward horizontal turning movement of the two flap plates into a sealing position against the roll upon further forward movement of the truck, and the third and highest force stage being attained by the lifting movement of the paper roll,

whereby, as the truck moves the vacuum pad unit forwardly against a roll, in the said first stage the upper part of the roll moves the upper part of the vacuum pad rearwardly towards the truck until vertical parallelism is attained between the vacuum pad unit and the roll surface, and at the same time turns the vacuum pad unit horizontally until symmetry is attained between the vacuum pad unit and the roll surface, followed by the said second stage, in which the two flap plates are turned forwardly against the roll surface into correct sealing position, caused by increasing horizontal forces transferred from the truck's forward movement force via the balance arm, further followed by the said third stage that occurs in the lifting moment, in which said tilting forward torque effect of the paper roll in a lifted position is converted by the flap plates, via the balance arm, into a substantial additional flap plate closing torque, the said third stage giving an essentially higher sealing pressure to the sealing rubber on the flap plates then would be caused by the vacuum alone, and also attaining a mechanical clamping effect in addition to the holding force caused by the vacuum.

4,640,662

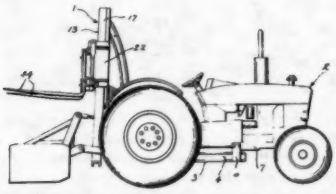
FORK LIFT ATTACHMENT FOR TRACTOR

Francis T. Spellman, Jr., Blue Springs, Mo., assignor to Hy-Lite Mfg. Co., Inc., O'Fallon, Mo.

Filed Jun. 3, 1985, Ser. No. 740,735

Int. Cl.[4] B66F 9/20

U.S. Cl. 414—642 **5 Claims**



1. In combination, a tractor having a power take-off, three-point hitch means connected to the rear of the tractor and mounted for vertical pivotal movement relative to said tractor, said three-point hitch means including a pair of lower arms and an upper arm disposed between said lower arms and located at a higher level than said lower arms, a sub-frame including a pair of elongated members, means for rigidly connecting the forward ends of the elongated members to the respective sides of said tractor, an upstanding mast pivotally connected to the rear end of the sub-frame and including a pair of spaced side members, said power take-off being aligned with the space between said side members, rack means mounted for movement on said mast, a pair of lift forks carried by said rack means, and means for raising and lower said rack means relative to the mast to thereby raise and lower said forks, said upper arm extending through the space between said side members and said lower arms located outwardly of the respective side members, whereby said lift forks and said three-point hitch means can each be used independently without disconnecting the other from said tractor.

4,640,663

BALANCER AND CONTROLLING METHOD THEREOF

Tatsuya Niinomi, Yokohama, and Hiroshi Kikuchi, Hiratsuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

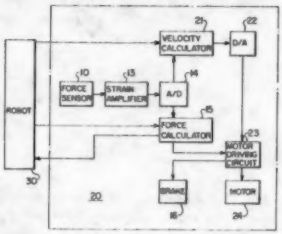
Filed Dec. 2, 1983, Ser. No. 557,430

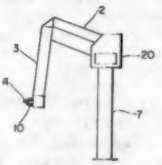
Claims priority, application Japan, Dec. 13, 1982, 57-216801

The portion of the term of this patent subsequent to Sep. 17, 2002, has been disclaimed.

Int. Cl.[4] B66C 23/00

U.S. Cl. 414—730 **20 Claims**





1. A method of controlling a balancer, comprising the steps of:

receiving a first instruction for controlling movement in a vertical direction of the arm of a balancer;

moving said arm according to said first instruction while the distal end of said arm is subjected to external forces;

detecting a force added to the arm along said vertical direction with a force sensor mounted on the distal end portion of the arm;

determining a velocity instruction for the balancer in response to the first signal and directing the distal end of the balancer to follow movement indicated by said external forces by modifying said velocity instruction with a second signal derived from the force sensor; and

applying said velocity instruction to control the velocity of the balancer.

4,640,664

METHODS OF CONTROLLING OPERATION OF MULTISTAGE HYDRAULIC MACHINES

Shinsaku Sato, Ebina, and Ichiro Yamagata, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 12, 1984, Ser. No. 588,362

Claims priority, application Japan, Mar. 15, 1983, 58-42690; Mar. 15, 1983, 58-42691; Mar. 15, 1983, 58-42692; Mar. 15, 1983, 58-42693

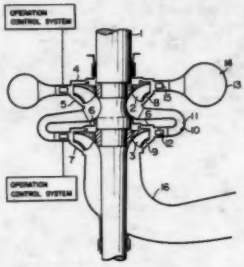
Int. Cl.[4] F01D 17/00

U.S. Cl. 415—1 **10 Claims**

1. A method of controlling the operation of a multistage hydraulic machine for aimed load adjustment under a normal operation condition in which respective pressure stages are

connected in series through runners and return passages and highest and lowest pressure stages are provided with movable guide vanes having variable degrees of openings, said method comprising the steps of:

controlling the degree of opening of movable guide vanes of one of the highest and lowest pressure stages of the multistage hydraulic machine to a degree of opening corresponding to an aimed load and satisfying a relative relation



between degrees of opening of said highest and lowest pressure stage movable guide vanes for achieving a high performance operation under a predetermined head; and

controlling the degree of opening of movable guide vanes of the other one of the highest and lowest pressure stages to a degree of opening satisfying a relative relation between the degrees of openings of the movable guide vanes of the highest and lowest pressure stages for maintaining a hydraulically stable operation under a predetermined head.

4,640,665

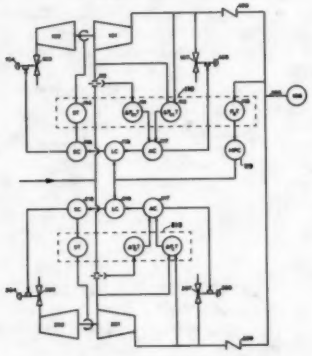
METHOD FOR CONTROLLING A MULTICOMPRESSOR STATION

Naum Staroselsky, and Saul Mirsky, both of Des Moines, Iowa, assignors to Compressor Controls Corp., Des Moines, Iowa

Division of Ser. No. 418,224, Sep. 15, 1982, Pat. No. 4,494,006. This application Nov. 13, 1984, Ser. No. 657,200

Int. Cl.[4] F04D *13/12, 27/00*

U.S. Cl. 415—1 **2 Claims**



1. A method of controlling a compressor station receiving gas from an upstream process, compressing the gas and delivering it to a process downstream thereof, said compressor station having a station control means to adjust the station performance to the demand of a process located upstream or downstream, said compressor station including also one dynamic compressor driven by a prime mover, said dynamic compressor having a variable performance, a main control means associated with said compressor for changing its performance, and a surge control means associated with said compressor for maintaining said compressor along a surge control line having a predetermined equation and located a predetermined distance from its surge limit; said method comprising:

transforming said predetermined equation of said surge control line into a variable criterion representing a relative distance between said compressor's operating point and its surge control line, said variable criterion reaching some predetermined value when said relative distance reaches zero value; and

changing set points for said criterion representing the relative distance between said compressor's operating point and its surge control line by changing an output of said station control means to control the performance of said compressor station and limiting said set points and providing for a decoupling between said compressor and said station control means to avoid a dangerous approaching of said surge limit line after the compressor's operating point crosses its surge control line and reaches some predetermined deviation from said control line.

4,640,666

CENTRIFUGAL PUMP

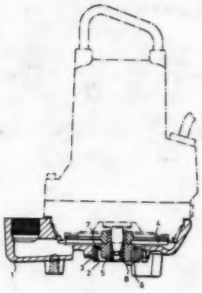
Bengt Sodergard, Upplands Vasby, Sweden, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 535,109, Sep. 23, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 751,472

Claims priority, application Sweden, Oct. 11, 1982, 8205774

Int. Cl.[4] B02C *18/40*

U.S. Cl. 415—121 B **5 Claims**



1. A centrifugal pump for pumping liquids containing solid objects, such as rags and other elongated objects, comprising

a pump housing having an internal surface bounding an inlet opening and provided with grooves; and

an impeller having a part thereof received in said inlet opening for rotation therein, said part having a substantially cylindrical outer circumferential surface which is spaced a distance from said internal surface to form a slot therebetween to reduce underpressure at the center of the impeller, a primary cutting means having at least two substantially axially extending cutting portions on said part projecting radially outwardly from the said cylindrical surface, each of said primary cutting portions having a surface inclined relative to the longitudinal axis of said impeller which cooperates with edges of said internal surface which forms said grooves to cut the objects, at least one secondary cutting means having a surface projecting radially outwardly from said substantially cylindrical outer circumferential surface and up to one edge of said central inlet opening and cooperating with the edges of said internal surface which forms said grooves to cut the objects, and a projection extending axially outside of said inlet opening from each of said primary cutting portions to

create a flow pattern to direct the solid objects to said primary cutting portions.

4,640,667

APPARATUS FOR CONVEYING AND COMPRESSING A GASEOUS MEDIUM

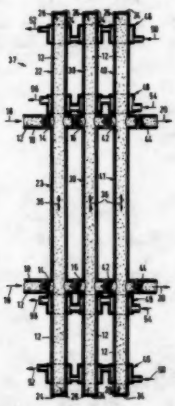
Christian Trepp, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Division of Ser. No. 601,370, Apr. 17, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,639

Claims priority, application Switzerland, Apr. 29, 1983, 2339/83

Int. Cl.⁴ F04B *19/24, 23/04*

U.S. Cl. 417—52 **4 Claims**



1. In combination

a pair of apparati for conveying and compressing a gaseous medium, each apparatus comprising a line for conveying a gaseous medium, a plurality of vessels connected in series to said line, each vessel having a chamber in communication with said line for receiving gaseous medium, heat exchange means disposed about each said vessel for exchanging heat with a gaseous medium in said respective vessel to generate thermoacoustic oscillations therein, and check valves in said line about each said vessel for conveying a compressed gaseous medium through said line in a downstream direction; and

a plurality of tubes connected to and between respective vessels of each apparatus to increase the amplitude of oscillation therein.

4,640,668

CEILING FAN WITH ADJUSTABLE BLOWING SCOPE THRU A SPEED-SERVO AND WITH DRIVING SPEED CONTROL MEANS

Tai-Her Yang, 5-1 Tay Pyng St., Shi Hwu Jenn, Jang Hush Shiann, Taiwan

Filed Aug. 2, 1982, Ser. No. 404,384

Int. Cl.⁴ F04B *35/04;* **F04D** *29/36*

U.S. Cl. 417—354 **1 Claim**

1. A ceiling fan comprising:

an outer case having a ring-shaped groove under a top portion thereof and having a ring-shaped groove under a bottom portion thereof;

a driving motor, housed in said outer case, having a rotor with upper and lower shaft portions;

a first flange bushing positioned at said top portion of said case and having a ring-shaped groove corresponding to the ring-shaped groove under the top portion of said outer case;

a second flange connected to said lower shaft portion, said second flange positioned at said bottom portion of said case and having a ring-shaped groove corresponding to the ring-shaped groove under the bottom portion of said outer case;

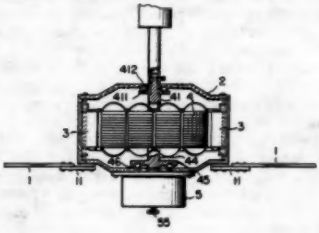
steel balls positioned in a first track defined by said ring-shaped groove in said first flange bushing and the corresponding ring-shaped groove in said top portion of said outer case;

steel balls positioned in a second track defined by said ring-shaped groove in said second flange and said corresponding ring-shaped groove under said bottom portion of said outer case;

an adjustable blade structure attached to said outer case,

said adjustable blade structure consisting of a plurality of fan shank seats, each said fan shank seat having a base and a pivot joint, each said fan shank base attached to said outer case, a plurality of fan shanks, each shank respectively pivotably mounted on a said pivotal joint of a said fan shank seat, a plurality of fan blades, each said fan blade respectively attached to a said corresponding said fan shank; and

means for motor speed control, wherein said motor speed control means includes an adjustable centrifugally controlled triac, said triac providing an intermittent power



whereby power to the motor is interrupted on an intermittent basis to thereby regulate the motor speed, said triac having a collector and a base, a centrifugal switch, said collector and said base electrically connected to said centrifugal switch, said triac is electrically in series with said driving motor which are then connected in parallel with an AC power supply, said lower shaft portion of said rotor coupling with said centrifugally controlled means,

said centrifugally controlled means including two conducting pieces installed in close abutting contact on the lower end of said shaft portion, biasing means comprising a sliding piece connected with a pair of weighted blocks and a spring, an insulating block, said biasing means biasing said insulating block, said insulating block then in turn urging said two connecting pieces into electrical contact,

whereby when said centrifugally controlled means rotates together with said outer case and reaches a preset speed, the said insulating block will be pulled downwardly and said two conducting pieces will thus separate from each other to thereby interrupt the power supply circuit to said driving motor such that the running speed of driving motor reduces below said preset speed and whereby said biasing means will urge said insulating blocks upwardly against said conducting pieces to re-make electrical contact between said conducting pieces; and

said centrifugally controlled means may be set at said preset speed by adjusting the tension of said biasing means by means of a screw.

4,640,669

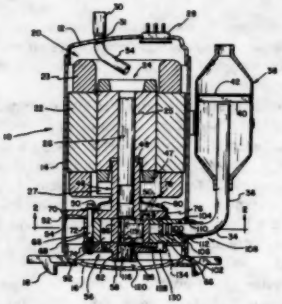
ROTARY COMPRESSOR LUBRICATION ARRANGEMENT

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 670,307, Nov. 13, 1984, abandoned. This application Mar. 6, 1986, Ser. No. 837,660

Int. Cl.[4] F04B *17/00, 35/04*

U.S. Cl. 417—410 **10 Claims**



1. In a rotary compressor including a vertical crankshaft rotatably journalled in a bearing, a compressor cylinder including a vane slot in a wall of said cylinder and a sliding vane slidably received in said vane slot for compressing a compressible gas, said vane having at least two sliding surfaces, lubrication means for lubricating said vane comprising:

an oil sump located in a lower portion of said housing;

oil pumping means comprising an axial passageway in said crankshaft, said passageway communicating with said oil sump for pumping oil upwardly from said sump;

an upwardly extending lubrication passage in said cylinder, said passage being open to said vane slot;

duct means directly connecting said lubrication passage to said axial passageway for supplying oil upwardly under positive pressure against gravity from said axial passageway to said lubrication passage for lubricating said at least two sliding surfaces of said vane.

4,640,670

PREPARATION OF A ROLLED PASTRY PRODUCT

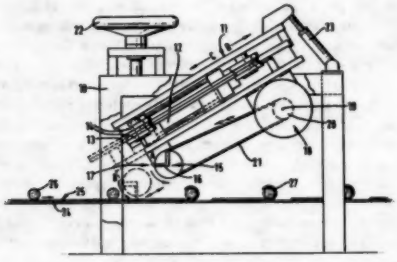
Anders G. Svengren, Ängelholm, and Bertil A. Ganrot, Bjuv, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 640,700, Aug. 14, 1984, Pat. No. 4,600,595. This application May 9, 1986, Ser. No. 861,538

Claims priority, application European Pat. Off., May 2, 1984, 84104918.2

Int. Cl.[4] B29C *53/02;* **A21C** *5/00, 11/10*

U.S. Cl. 425—142 **10 Claims**



1. An apparatus which comprises a conveyor means, means for feeding a pastry material in a sheet onto the conveyor, a knife capable of oscillating and having a cutting edge positioned above the conveyor such that the cutting edge of the knife extends laterally across the width of the sheet of pastry and the conveyor, and means for controlling the movement of the knife such that

(a) the cutting edge contacts and cuts through the pastry sheet which advances on the conveyor, and

(b) the knife then raises and rotates about its longitudinal axis in a direction such that the motional vector of the cutting edge is counter to the downstream direction of the conveyed sheet of pastry material and maintains contact with and lifts up and folds over and then releases the forward edge of the pastry sheet onto the advancing pastry sheet, and

(c) the knife then descends and rotates in the reverse direction so that the cutting edge is in a position to again contact and cut through and fold the advancing pastry sheet behind the advancing cut and folded portion.

4,640,671

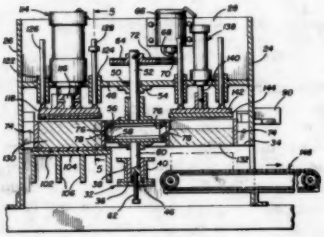
ADOBE BLOCK PRESS

John W. Wright, P.O. Box 7397, Grants, N. Mex. 87020

Filed Dec. 5, 1985, Ser. No. 804,860

Int. Cl.[4] B28B *17/00*

U.S. Cl. 425—149 **9 Claims**

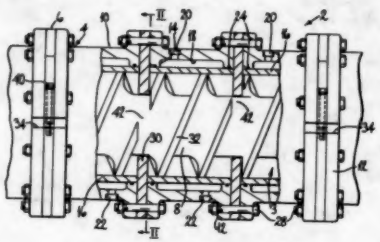


1. An apparatus for forming building blocks from freshly dug soil, said apparatus including a frame, a rotary table journalled from said frame for intermittent angular displacement about an upstanding axis and defining at least three peripherally spaced open-ended vertically extending sleeve-type cavities spaced equally radially outwardly from said axis, said frame defining first soil receiving, second pressure head and third ejection head stations spaced about said axis and with which said cavities are successively registrable, said soil receiving station being adapted to receive freshly dug soil and opening downwardly for discharging soil therefrom into cavities of said table successively registered therewith, said pressure head station including downwardly facing pressure head means displaceable downwardly into a cavity of said table registered therewith for vertically compressing the soil therein and said ejection head station including a vertically shiftable ejection head for ejecting a compressed soil block from a cavity of said table registered therewith, said frame including horizontal plate means disposed at and extending along an arcuate path portion extending at the first and second stations and defining a bottom for said cavities disposed thereat as they move to said first and second stations, adjustment means operably connected between said frame dnd table for vertically shifting said table along said upstanding axis.

4,640,672
MODULAR EXTRUDER BARREL CONSTRUCTION

Henry Ellwood, Rochdale, England, assignor to Farrel Corporation, Ansonia, Conn.

PCT No. PCT/GB84/00396, § 371 Date Jul. 3, 1985, § 102(e) Date Jul. 3, 1985, PCT Pub. No. WO85/02364, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 20, 1984, Ser. No. 756,514
Claims priority, application United Kingdom, Nov. 26, 1983, 8331653
Int. Cl.[4] B29B 7/13
U.S. Cl. 425—192 R 5 Claims



1. An extruder characterized by a plurality of barrel modules arranged in alignment, at least two adjacent barrel modules having a plate secured between each pair of adjacent barrel modules, each plate and each barrel module being interchangable, each plate being formed of two or more arcuate parts each plate having an opening passing therethrough and comprising projections extending into said opening, the opening of the plate and internal surfaces of the barrel modules forming a substantially continuous passageway which provides an extrusion chamber of a barrel of the extruder and a screw in the extrusion chamber having one or more helical flights projecting from a root portion of the screw, the flights being discontinuous and arranged to leave annular spaces between adjacent flight sections into which the projections extend towards the root of the screw, the barrel modules being provided with external flanges extending around end portions thereof, the flanges containing a plurality of bore holes which correspond to bore holes passing through a respective part of a plate around the external circumference thereof, so that the plate parts are secured between two adjacent barrel modules by fastening means inserted in aligned bore holes of the plate parts and external flanges, and the plate parts are removable in a radial direction when the fastening means are removed from the plate parts.

4,640,673
COMPRESSION MOLDING APPARATUS

Hiroshi Takeda; Noritsugu Oshima, both of Kanagawa; Tateo Kubo, Hiratsuka, and Kenichi Sakaguchi, Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,534
Claims priority, application Japan, May 22, 1984, 59-101776
Int. Cl.[4] B29C 43/08, 45/06
U.S. Cl. 425—297 31 Claims

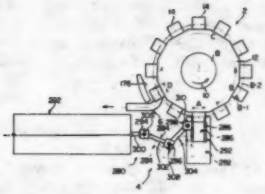
1. A compression molding apparatus comprising

a rotary compression molding means including a rotating supporting member mounted rotatably about its central axis, a plurality of molding die means mounted on said rotating supporting member at circumferentially spaced intervals, each of said molding die means having an upper die assembly and a lower die assembly cooperating with each other, at least one of the upper die assemblies and one of the lower die assemblies being freely movable with respect to the other, a driving source for rotating said rotating supporting member in a predetermined direction and moving said molding die means through a circular conveying passage including a material charging zone, a molding zone, a cooling zone and an article discharging zone located successively , and a die opening-closing means for moving at least one of said upper and lower die assemblies in a predetermined manner with respect to the other according to the movement of said molding die means;

a material feed means for feeding a plastic material to said molding die means in said material charging means; and

an article carrying means for carrying the molded article from the molding die means in said article discharging zone,

wherein said material feed means comprises an extruding means for extruding a molten plastic material through an extrusion opening and a cutting means for cutting the

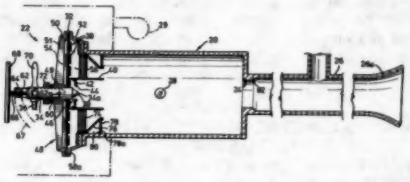


plastic material extruded from the extrusion opening and feeding it to the molding die means; the cutting means comprises comprising a rotating cutting blade mounted for rotation across the extrusion opening, a driving source and drivingly connecting means for drivingly connecting the driving source to the rotating cutting blade; the drivingly connecting means including a non-uniform speed rotating mechanism for converting the uniform speed rotation of the driving source to a non-uniform speed rotation, and a rotating angular position adjusting mechanism in which the relative angular position between its input end drivingly connected to the output end of the non-uniform speed rotating mechanism and its output end drivingly connected to the rotating blade can be freely adjusted.

4,640,674
PULSE COMBUSTION APPARATUS

John A. Kitchen, Hastings, Canada, assignor to John A. Kitchen Ltd., Hastings, Canada

Filed Jan. 2, 1986, Ser. No. 815,488
Int. Cl.[4] F23C 11/04
U.S. Cl. 431—1 11 Claims



1. A pulse combustion apparatus comprising:

a combustion chamber having inlet means for fuel charges and an outlet for exhaust gases remote from the inlet means;

an exhaust pipe extending from said exhaust gas outlet and forming a resonant system with the combustion chamber; and,

means operable to initiate combustion in said chamber;

wherein said fuel charge inlet means comprises:

a plurality of one way air inlet valves which open and permit air to enter the combustion chamber during low pressure

portions of successive pulse combustion cycles, and close during high pressure portions of said cycles, said valves including at least one primary air inlet valve;

a fuel nozzle having a fuel inlet for connection to a fuel supply externally of the combustion chamber, and a fuel outlet;

means removably supporting the nozzle with its fuel outlet in the combustion chamber adjacent said primary air inlet valve, while permitting removal of the nozzle at appropriate times and replacement with a nozzle for a different fuel;

baffle means within the combustion chamber co-operating with said nozzle to define a metering orifice through which air entering the combustion chamber from the primary air inlet valve is constrained to flow;

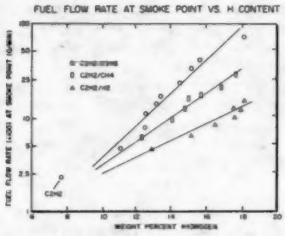
said nozzle support means being adapted to position the nozzle with respect to said baffle means to determine the size of said metering orifice according to the volume of primary air required to maintain continuous combustion commensurate with a pulse cycle of reasonable strength.

4,640,675

METHOD OF BURNING LOW HYDROGEN CONTENT FUELS

Gary J. Green, Yardley, Pa.; Harry A. McVeigh, Morrestown; Joe E. Penick, Princeton, both of N.J., and Tsoung Y. Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 659,124
Int. Cl.[4] F23C *1/00*
U.S. Cl. 431—2 **15 Claims**



11. In a process for burning a heavy residual fuel by injecting said fuel into a burning zone via an atomizer and wherein said fuel has a viscosity at the atomizer of at least about 20 centistokes, the improvement comprising dissolving in said residual fuel 1 to 20 wt% of a light hydrogen rich hydrocarbon, which comprises methane and at least one other gas selected from the group consisting of ethane, propane, butane, ethylene, propylene and butylene, admixed with the methane, whereby the viscosity and sooting tendency of said fuel are reduced.

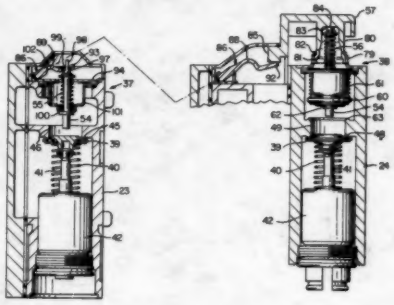
4,640,676

BURNER CONTROL DEVICE, SYSTEM AND METHOD OF MAKING THE SAME

Jay R. Katchka, Cypress; George A. Yeaman, and Richard W. McKinney, both of Lakewood, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 20, 1985, Ser. No. 767,721
Int. Cl.[4] F23Q *9/08*
U.S. Cl. 431—54 **15 Claims**

1. In a control device for supplying fuel to a burner means, said device comprising a housing means having an inlet means for being interconnected to a source of fuel and having an outlet means for being interconnected to said burner means, and first and second control valve means carried by said housing means and being in series to connect said inlet means to said outlet means only when both of said control valve means are in an open condition thereof, each said control valve means comprising a movable valve member resiliently biased closed and an independent electromagnetic valve member latching means energizable to hold its respective said valve member open and deenergizable to allow its respective said valve member to close, each said control valve means having movable means to open its respective said valve member to a latching position so as to be held open by its respective said latching means when its respective said latching means is energized, the



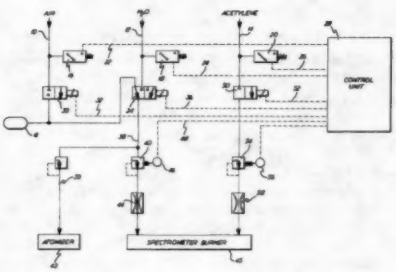
improvement comprising a single manually movable actuator means carried by said housing means and comprising a push button-like member and means operatively interconnecting said movable means together and being operatively associated with said push button-like member so that said valve members will move substantially in unison to their said latching positions as said actuator means is being moved to an actuated position thereof.

4,640,677

GAS CONTROL DEVICE FOR CONTROLLING THE FUEL GAS AND OXIDIZING AGENT SUPPLY TO A BURNER IN AN ATOMIC ABSORPTION SPECTROMETER

Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 704,830
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407552
Int. Cl.[4] F23N *1/02*
U.S. Cl. 431—89 **6 Claims**



1. A device for controlling fuel gas and oxidizing agent supplied to a burner **(45)** in an atomic absorption spectrometer, comprising:

a fuel gas line **(14)** for supplying fuel gas to said burner **(45)**;

an oxidizing agent supply conduit **(38)** for supplying an oxidizing agent to said burner **(45)**;

a first oxidizing agent supply line (10) for supplying a first oxidizing agent to said oxidizing agent supply conduit (38);

a second oxidizing agent supply line (12) for supplying a second oxidizing agent, having a higher oxygen content than said first oxidizing agent, to said oxidizing agent supply conduit (38);

a control unit (28);

a first restrictor (58) and a first pressure regulator (54) disposed in said fuel gas line; a second restrictor (44) and a second pressure regulator (40) disposed in said oxidizing agent supply conduit (38); the regulators being connected upstream of the restrictors, respectively;

first (56) and second (46) servomotors connected to said first and second pressure regulators, respectively; each of said servomotors being connected to receive signals from said control unit (28) for adjusting the pressure settings of said pressure regulators, respectively;

a 3/2-directional solenoid control value (34) connected between said oxidizing agent supply conduit (38) and said first oxidizing agent supply line (10) in a first valve position, and said 3/2-directional solenoid control valve (34) being connected between said oxidizing agent supply conduit (38) and the second oxidizing agent supply line (12) in a second valve position; said solenoid control valve (34) being connected to receive signals from said control unit (28) for controlling the valve position;

a first shut-off solenoid valve (30) disposed in said first oxidizing agent supply line (10), said first shut-off solenoid valve being connected to receive signals from said control unit (28) for controlling the first shut-off solenoid valve;

a second shut-off solenoid valve (50) disposed in said fuel gas line upstream of said first pressure regulator (54), said second shut-off solenoid valve (50) being connected to receive signals from said control unit (28) for controlling the second shut-off solenoid valve position;

a first pressure sensor (16) disposed in said first oxidizing agent supply line (10) upstream of said first shut-off solenoid valve (30), said first pressure sensor being connected to send signals to said control unit (28) responsive to the pressure in the first oxidizing agent supply line (10);

a second pressure sensor (18) disposed in said second oxidizing agent supply line (12) upstream of said 3/2-directional solenoid control valve (34), said second pressure sensor being connected to send signals to said control unit (28) responsive to the pressure in the second oxidizing agent supply line (12);

a third pressure sensor (20) disposed in said fuel gas line upstream of said second shut-off solenoid valve (50), said third pressure sensor being connected to send signals to said control unit (28) responsive to the pressure in the fuel gas line (14).

4,640,678

DUAL-VALVE AIR-GAS CONTROLLER

Joseph Fraioli, 8 Seymour Pl., White Plains, N.Y. 10605

Filed Sep. 26, 1985, Ser. No. 780,666
Int. Cl.[4] F23N *5/00*
U.S. Cl. 431—75 **8 Claims**

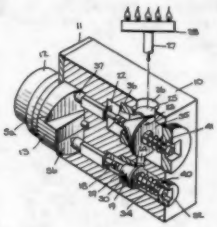
1. A dual-valve controller adapted to mix incoming air and gas derived from air and gas sources to produce a combustible output mixture and to adjust the flow rate of the output mixture without altering the air-gas ratio, said controller comprising:

(A) a mixing chamber yielding said output mixture;

(B) an air-control valve whose input is coupled to the air source and whose output is coupled to said chamber to supply air thereto at a flow rate which depends on the extent to which this valve is open;

(C) a gas-control valve whose input is coupled to the gas source and whose output is coupled to said chamber to supply air thereto at a flow rate which depends on the extent to which this valve is open, said gas-control valve being in parallel relation to said air-control valve;

(D) means including a single control element coupled both to said air control and said gas control valve to concurrently operate these valves from an initially closed state to a fully open state whereby the flow rate of the output mixture yielded by the chamber may be varied progressively, said means including a circular cam block coupled to said control element and turned thereby, said block having an indented inner face defining upper and lower



cam surfaces, said valves each having an axially displaceable valve element and provided with a cam follower which engages a respective cam surface, the upper cam surface having a depth relative to the inner face which is at a maximum value at one end of the block and is at a minimum value at the other end thereof, said lower cam surface having the reverse configuration whereby when the block is turned, both cam followers are concurrently displaced axially to progressively open their associated valves as the maximum setting of the controller is approached.

4,640,679

FLAME SHIELD FOR CIGARETTE LIGHTER AND CIGARETTE LIGHTER INCLUDING SAID FLAME SHIELD

Denis Perrin, 1315 Avenue "P", Ottawa, Ontario, Canada K1G 0B4

Filed Oct. 15, 1984, Ser. No. 661,041
Int. Cl.[4] F23Q *25/00*
U.S. Cl. 431—146 **9 Claims**

1. In a disposable lighter having a fuel receptacle, a pyrophoric sparking wheel lighting mechanism mounted on the top edge thereof, and a finger-actuated fuel control valve adjacent said sparking wheel, the improvement comprising: a windshield of similar cross-section to that of said receptacle and slidably retained on said receptacle, said windshield comprising two solid side walls and a solid back wall, an open top and an open front wall having a lower peripheral ring joining two mutually opposed solid side walls, said solid side walls having a cut-away portion to allow unhindered access by a thumb of a user to said sparking wheel lighting mechanism, said open front wall having a cigarette-access opening above said cut-

away portion of said side walls, said windshield being slidable along the outside of said receptacle from a lower position where the bottom periphery of said windshield abuts a lower cap on said receptacle to an upper position where the upper edge of said lower peripheral ring abuts an upper stop member on said receptacle said windshield being between about 50% and about 100% of the height of the receptacle.

4,640,680

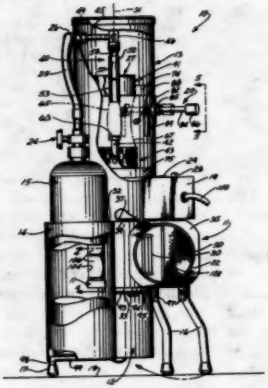
PORTABLE GAS-FIRED FORCED-DRAFT HEATER

Thaddeus A. Schilling, 549 Shoshone St., Lander, Wyo. 82520

Filed May 20, 1985, Ser. No. 735,993

Int. Cl.[4] F23D *14/46*

U.S. Cl. 431—350 **26 Claims**



1. Combustion apparatus for burning a gaseous fuel-air mixture and adapted for use within a surrounding high velocity air stream, the apparatus comprising

(a) a fuel and air mixing nozzle assembly for mixing fuel supplied to the assembly with air, for creating an essentially entirely gaseous mixture of fuel and air, and for discharging that mixture along a discharge axis of the assembly to a combustion zone surrounded by the air stream, the assembly being adapted for connection to a source of fuel for supply of fuel from the source to the assembly, the assembly having a discharge end on said axis through which the mixture is discharged to the combustion zone, and

(b) spaced upstream and downstream combustion zone shroud means disposed along said axis respectively upstream of and adjacent the nozzle assembly discharge end and at a location downstream of said assembly discharge end for creating in the combustion zone, during the existence of said air stream therepast, a region of relatively nonturbulent gas having a pressure higher than the pressure in said air stream and in which combustion of the fuel-air mixture can occur, the shroud means including plate means disposed substantially normal to the axis upstream and downstream of the discharge end of the nozzle assembly, the upstream shroud means including a cup-like shroud having a diameter greater than that of the nozzle assembly discharge end and disposed coaxially of the nozzle assembly discharge end upstream of said higher pressure region to be open toward the downstream shroud means, said shroud having walls substantially parallel to the axis, the shroud having a base comprised by said plate means between the walls thereof and apertures of selected size through the base adjacent the shroud walls,

(c) the apparatus being characterized by the absence, between the upstream and downstream shroud means, of physical structure between the high velocity air stream and the region of relatively nonturbulent gas.

4,640,681

METHOD AND APPARATUS FOR THE REMOVAL OF HARMFUL AND WASTE MATERIALS BY COMBUSTION

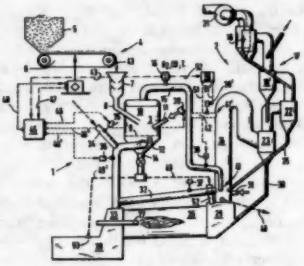
Eberhard Steinbiss, Cologne; Horst Herchenbach, Hennef, and Albrecht Wolter, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 644,929, Aug. 27, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 771,156

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330667; Apr. 21, 1984, 3415211

Int. Cl.[4] F27B *15/00*; F23D *1/00*

U.S. Cl. 432—14 **11 Claims**



1. A method for the removal of hazardous substances from hazardous and waste materials which comprises:

providing a process for manufacturing cement clinker which includes the steps of preheating the cement raw material, calcining the preheated raw material in a precalciner, sintering the calcined raw material in a kiln following said precalciner, and cooling the clinker thus produced in a cooler,

diverting heated air from the cooler of the cement making process according to the heat content of the substances to be burned at temperatures in the range from 600° C. to 950° C. to a furnace in which said hazardous and waste materials are combusted under conditions sufficient to achieve a combustion temperature and flue gas temperatures in said furnace of at least 1250° C., withdrawing and discharging a portion of the hot flue gas from said kiln by means of a bypass, the amount of said portion depending on the relative amounts of hazardous materials contained in said furnace flue gas,

directing the hot flue gas from said furnace into the precalciner of said cement making process for supplying heat thereto, and

adding to said hazardous and waste material a quantity of calcium containing carbonate carriers such that the CaO content of the calcination product is in the range of between 30% to 70% by weight.

4,640,682

PULSE JET COMBUSTOR DEHYDRATION CONE CONSTRUCTION

Robert R. Gray, 110 Via Monte Mar Dr., Gladstone, Oreg. 97027, and Thomas G. Lindahl, 7325 SW. Mallard Ct., Portland, Oreg. 97223

Filed Oct. 3, 1985, Ser. No. 783,858

Int. Cl.[4] F27B *15/00*; B01D *1/16*; B01F *15/06*; F27D *7/00*

U.S. Cl. 432—58 **5 Claims**

1. In pulse jet combustor apparatus for the drying of particulate material of the type having

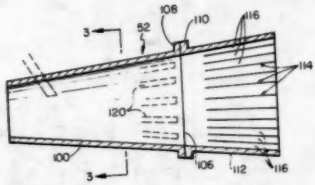
a combustion chamber,

an air inlet conduit connected to one end thereof

a primary exhaust gas outlet conduit connected to the other end thereof,

an elongate transition-tailpipe section connected to said primary exhaust conduit, and

a frusto-conically shaped drying section of increasing diameter connected to the downstream end of said transition-tailpipe section having means for introducing particulate material to be dried therein,



the improvement wherein

the downstream portion of said drying section includes a plurality of longitudinal slits extending through the terminal end thereof forming a plurality of individually vibratable finger-like sections integrally connected to the drying section at a location spaced a predetermined distance upstream of said terminal end thereof.

4,640,683

KILN FOR FIRING HEAVY CERAMICS

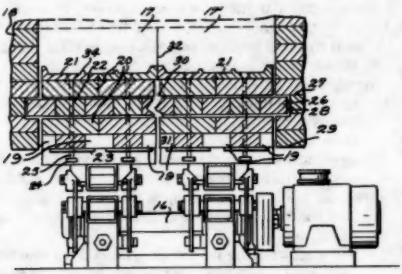
Giorgio B. Mori, Crta. Alcora, Km 10,400, Castellon, Spain

Filed Mar. 12, 1984, Ser. No. 588,590

Claims priority, application Spain, Mar. 22, 1983, 520853; Mar. 29, 1983, 521117; Mar. 29, 1983, 521118

Int. Cl.[4] F27B *9/14*; F27D *15/02*; F26B *9/00*

U.S. Cl. 432—134 **11 Claims**



1. A kiln for firing heavy ceramic articles comprising a hearth including a transport surface portion, a loading and unloading end disposed at spaced ends of said hearth, a supporting chassis, means mounting said transport surface portion on said chassis so that said surface portion is movable relative to said chassis, means rigidly mounting said chassis in said kiln, drive means for imparting a predetermined vibratory motion to said surface portion, said drive means including an eccentric member whereby said motion is generally rearwardly and downwardly directed during a first portion of a vibratory cycle, said means mounting said transport surface portion including spring means and said drive means including releasing means so that upon release of said surface portion from said drive means, said surface portion will move, under the influence of said mounting means and spring means, upwardly and forwardly an extent sufficient to shift an article resting on said surface portion in a forward direction in said hearth toward said unloading end, said means mounting said surface portion including conduit means extending along at least a portion of said hearth below said transport surface portion for conveying cool air along said hearth exteriorally thereof, insulating material being disposed between said transport surface portion and said conduit means, said kiln further including first conveying means for conveying articles to be fired to adjacent said loading end of said surface portion, a second conveying means for receiving articles from said first conveying means and pusher means for moving articles from said second conveying means to said transport surface portion, said kiln including an unloading conveying means adjacent said unloading end, a detainer stop extending transverse to said unloading end and being movable by contact with articles discharged from said surface portion, an unloading conveyor means cooperating with said detainer stop to receive and periodically move articles received from said surface portion away from said unloading end of said kiln.

4,640,684

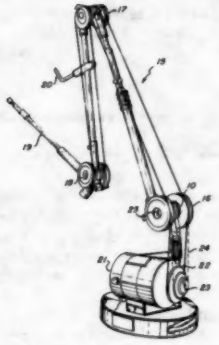
DENTAL DRILLING ASSEMBLY

Choong S. Hwang, 41-80 Parsons Blvd., Flushing, N.Y. 11355

Filed Sep. 25, 1985, Ser. No. 780,023

Int. Cl.[4] A61C *1/06*

U.S. Cl. 433—110 **2 Claims**



1. A triple arm dental drilling assembly containing arm members provided with pulley wheels and a motor provided with large and small size pulley wheels for conveying a belt member thereon, the improvement which comprises means for adjusting the distance between the arm pulley wheels that are closest to the motor, said means comprising a removably attached extension member inserted between said arm pulley wheels, whereby said extension member can be inserted between said arm pulley wheels to increase the distance therebetween to render them compatible with the large size pulley wheel on the motor, or can be removed to render them compatible with the small size pulley wheel on the motor.

4,640,685

HAND-HELD LIGHT FILTER

Theodore P. Croll, 685 S. Chubb Dr., Doylestown, Pa. 18901

Filed Apr. 15, 1985, Ser. No. 723,332

Int. Cl.[4] A61C *3/00*

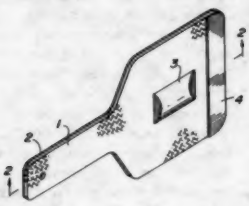
U.S. Cl. 433—141 **7 Claims**

1. A hand-held light shield device for use in dentistry, comprising:

a. a main paddle element which has optical properties necessary to filter out physically harmful light,

b. an intensity filter affixed to one side of said main paddle element,

c. a magnifying element on said main paddle portion, and



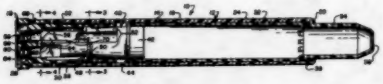
d. a light blue colored strip affixed to the end of said main panel portion.

4,640,686

AUDIBLE SIGNAL AUTOINJECTOR TRAINING DEVICE

N. Lawrence Dalling, Winchester, Va., and Linda A. Gordon, Germantown, Md., assignors to Survival Technology, Inc., Bethesda, Md.

Filed Feb. 24, 1986, Ser. No. 832,224
Int. Cl.[4] G09B *23/28*
U.S. Cl. 434—262 16 Claims



1. An automatic injector training device comprising

an automatic injector simulating assembly having a forward end arranged to be engaged with a muscle injection site of the user and an exterior periphery adapted to be manually gripped by a user, said assembly including

an outer structure,

a movable structure mounted for movement with respect to said outer structure (1) from a storage position into an audible signal producing position in response to an actuating movement performed by the user while manually gripping the exterior periphery of said assembly and thereby maintaining the forward end of said assembly in engagement with the injection site and (2) from said audible signal producing position into said storage position in response to a reset movement performed by the user,

cooperating audible signal producing means carried by said movable structure for movement therewith and operatively fixed with respect to said outer structure for producing an audible signal when said movable structure is moved from its storage position into its audible signal producing position in response to an actuating movement,

safety means mounted for manual movement out of a safety position with respect to said assembly, and

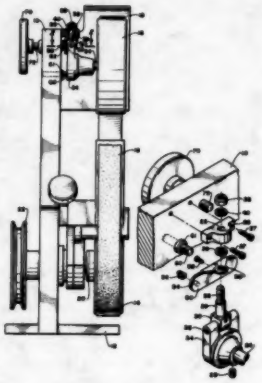
means operatively associated with said safety means (1) for preventing movement of said movable structure out of said storage position in response to a user actuating movement when said safety means is in said safety position (2) for enabling said movable structure to be moved from its storage position into its audible signal producing position in response to a user actuating movement when said safety means has been manually moved out of said safety position and (3) for enabling said movable structure to be moved from its audible signal producing position back into its storage position in response to a user reset movement.

4,640,687

IDLER PULLEY ADJUSTER

Donald W. MacCarthy, Sr., 11227 E. Rincon Dr., Whittier, Calif. 90606

Filed Jul. 2, 1985, Ser. No. 751,417
Int. Cl.[4] F16H *7/08*; B24B *21/00*
U.S. Cl. 474—101 4 Claims



1. A device for adjusting an idler pulley comprising:

an upright frame;

a first adjustable member rotatably attached to said frame for adjustment about a first axis;

a second adjustable member rotatably attached to said first member for adjustment about a second axis substantially perpendicular to the first axis;

an idler pulley rotatably supported by said second member on a third axis substantially perpendicular to said first two axes;

an elongate flat tracking bracket having a securing screw there through for engaging said first adjustable member to said tracking bracket, said tracking bracket having a projection means extending from its rear;

spring means positioned between said main frame and said rear of said tracking bracket and engaging said projection means for biasing said tracking bracket away from said main frame;

hanger means attached to said frame having a hole for holding said tracking bracket and said first adjustable means;

tracking knob means having a threaded shaft for pivoting said tracking bracket and biasing it towards said main frame; and,

screw means having its end projecting from said frame and positioned adjacent to said second adjustable member for pivoting said second adjustable member.

4,640,688

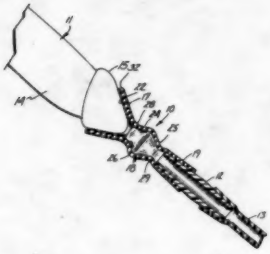
URINE COLLECTION CATHETER

Thomas M. Hauser, Sanibel, Fla., assignor to Mentor Corporation, Minneapolis, Minn.

Filed Aug. 23, 1985, Ser. No. 768,633
Int. Cl.[4] A61F *44/00*
U.S. Cl. 604—352 6 Claims

1. A urine collection catheter which is secured only to the tip of the penis and is formed of thin resilient material, the catheter having a tubular portion open at its outer end and designed to be connected to a urine receptacle and a cup shaped portion integrally connected to the inner end of said tubular portion, and forming the inner terminal part of said catheter, said cup shaped portion being of a shape and size to conform generally with that of the tip or glans of a typical penis, said cup shaped portion having a non-allergic pressure sensitive adhesive on the inner surface therof to enable said

catheter to adhere to the tip of a penis in urine tight relation when the catheter is pressed into engagement with such tip to



hold the tubular portion in urine conducting relation with the penis.

4,640,689

TRANSDERMAL DRUG APPLICATOR AND ELECTRODES THEREFOR

Dan Sibalis, Stony Brook, N.Y., assignor to Drug Delivery Systems Inc., New York, N.Y.

Continuation of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 524,252, Aug. 18, 1983, Pat. No. 4,557,723, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 778,183, Sep. 16, 1985, abandoned. This application Mar. 12, 1986, Ser. No. 839,050

Int. Cl.[4] A61N *1/30*

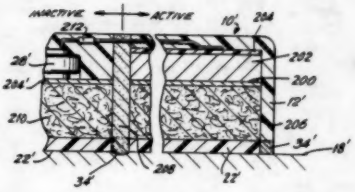
U.S. Cl. 604—20 **9 Claims**

1. A transdermal drug applicator for application to a living body for the migration of at least one medicament through the skin into the blood stream comprising:

at least two electrode elements forming said applicator and being separated from each other,

reservoir means, in at least one of said electrode elements of said applicator, for containing said medicament,

at least one of said electrode elements comprise reservoir means separted by a semi-permeable member which forms a drug gradient across said reservoir means,



a circuit means, including a power source, for supplying electric power to said electrodes and said reservoir means,

cover means partially enclosing at least said reservoir means, and

adhesive means for affixing said applicator to said skin, whereby an electrical circuit through the skin is formed when said applicator is affixed to said skin, thereby creating at least one physico/chemical mass transfer phenomena which causes said medicament to migrate through the skin.

4,640,690

COLORED THERMOPLASTIC RESIN COMPOSITION CONTAINING A COLORANT HAVING AN ALKYLENOXY-SUBSTITUTED CHROMOPHORE GROUP

Alan S. Baumgartner; Patrick D. Moore, and Richard A. VanDahm, all of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 13, 1985, Ser. No. 775,614

Int. Cl.[4] D06P *3/00, 5/13, 3/79, 3/24*

U.S. Cl. 8—506 8 Claims

1. A process for coloring a thermoplastic resin which comprises incorporating into said resin while said resin is in a molten state a colorant in the form of a polyalkyleneoxy-substituted chromophore group in a minor amount sufficient to provide coloration to said thermoplastic resin.

4,640,691

PAD DYEING PROCESS FOR WOOL

Wolfgang Richter, Hofheim am Taunus, and Bernd Dürl, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1986, Ser. No. 823,468

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3502960

Int. Cl.[4] C09B *62/00;* D06P *3/14*

U.S. Cl. 8—543 6 Claims

1. A pad cold batch process for dyeing wool with reactive dyes, which comprises padding the fiber material at a pH value between 7 and 9 with aqueous liquors containing the dissolved reactive dyes and then, to fix the dye, batching this padded fiber material in the moist state at temperatures up to at most 25° C., for 6 to 24 hours under the established weakly alkaline conditions.

4,640,692

PROCESS FOR THE ELIMINATION OF PYRITE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 26, 1985, Ser. No. 759,386

Int. Cl.[4] C10L *00/00;* C10B *57/00;* C09C *1/56;* C01B *31/02*

U.S. Cl. 44—1 SR 13 Claims

1. A process for the removal of pyritic sulfur from a pyritic containing solid comprising:

(a) reacting a first quantity of an acidic solution of cerium IV salt with a pyrite containing solid, wherein the molar ratio of the cerium IV salt to pyrite is less than the stoichiometric requirement to remove all of the pyrite from the solid;

(b) separating said cerium IV treated pyrite containing solid from the reaction mixture; and

(c) reacting the remaining pyrite-containing solid with a second quantity of an acidic solution of cerium IV salt, wherein the molar ratio is more than the stoichiometric to remove the remaining pyrite from the solid.

4,640,693

COATED SILICON NITRIDE CUTTING TOOL AND PROCESS FOR MAKING

Deepak G. Bhat, Troy; Dhirajlal C. Shah, Sterling Hgts.; John R. Kyle, Troy, and Paul F. Woerner, Grosse Pointe Farm, all of Mich., assignors to GTE Valeron, Troy, Mich.

Filed Apr. 15, 1985, Ser. No. 723,222

Int. Cl.[4] B24D *11/00*

U.S. Cl. 51—295 40 Claims

1. A coated ceramic silicon nitride cutting tool comprising a substrate comprising a major portion by volume of silicon nitride, a layer of refractory material, and an interfacial layer intermediate said substrate and said layer of refractory material, said interfacial layer comprising a refractory metal chemically reacted to form a reaction bonded refractory metal nitride for enhancing the adherence of said layer of refractory metal material to said substrate.

4,640,694

ADSORPTION PROCESS

Paul Leitgeb, Munich; Johann Leis, Egling, and Dietmar Winkler, Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

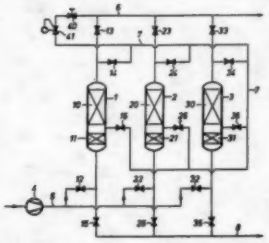
PCT No. PCT/EP83/00048, § 371 Date Nov. 27, 1984, § 102(e) Date Nov. 27, 1984, PCT Pub. No. WO84/03231, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 24, 1983, Ser. No. 668,370

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132758

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 18 Claims



1. In a pressure swing adsorption process wherein a gaseous mixture under elevated pressure is conducted in cyclic alternation through only three adsorbent-filled adsorbers, with selective adsorption of at least one first component and formation of a product depleted in said first component, each adsorber passing through mutually chronologically shifted switching cycles, and each switching cycle comprising an adsorption phase at maximum process pressure, expansion phases conducted first cocurrently and then countercurrently to the adsorption direction, a desorption phase at minimum process pressure, and pressure buildup phases for restoring the adsorption pressure, and wherein pressure equalization takes place between an adsorber in a cocurrent expansion phase and an adsorber in a pressure buildup phase, the improvement which comprises the following sequential phases: after termination of the adsorption phase of (a) a first adsorber, a first cocurrent expansion phase with the thus-obtained expansion gas being utilized for scavenging a second adsorber which is in a desorption phase; (b) a second cocurrent expansion phase with the thus-obtained expansion gas is utilized for pressurizing the second adsorber; (c) a countercurrent expansion phase during which a residual gas is withdrawn from the inlet end of the first adsorber; (d) the desorption phase during which scavenging is carried out with a cocurrent expanion gas from the third adsorber; and (e) two pressure buildup phases of which the first takes place in pressure equalization with the third adsorber which is in the second cocurrent expansion phase, and the second takes place by introduction of product gas by way of the outlet end of the adsorber.

4,640,695

SEGMENTED ELECTRODE COLLECTING PANEL ASSEMBLY

James H. Adams, Pleasant Grove; Jerry L. Burgess, Birmingham, and William C. Wagers, Alabaster, all of Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 21, 1986, Ser. No. 842,598

Int. Cl.[4] B03C *3/47*

U.S. Cl. 55—130 5 Claims

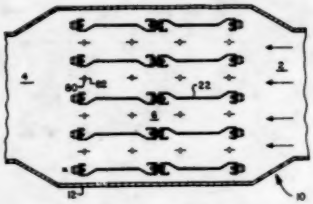
1. A collecting electrode panel assembly for mounting within a precipitation chamber housing of an electrostatic precipitator, comprising:

a. an electrode support member adapted to be supported by the housing of the precipitator;

b. a plurality of collecting electrode plates disposed in suc-

cessively aligned relationship beneath and suspended from said electrode support member, each of said collecting electrode plates having a pair of spaced end members and a central web portion extending between and interconnecting the spaced end members, each end member having an edge surface extending substantially transverse to the central web portion;

c. suspension means operatively associated with said collecting electrode plates for suspending said collecting electrode plates from said electrode support member, said suspension means comprising a plurality of suspension



lugs mounted to said electrode support member and disposed therealong such that a suspension lug extends outwardly therefrom adjacent each of the end members of said collecting electrode plates; and

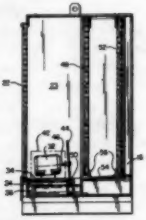
d. fastener means for mounting each of the end members of said collecting electrode plates to one of said suspension lugs, said fastener means having a longitudinal axis disposed substantially transverse to the edge surface of the end member such that said fastener means does not extend beyond the lateral extremities of the edge surface of the end member.

4,640,696

APPARATUS FOR CLEANING AND CONDITIONING GAS

Roger J. Hicks, Lakewood, and John W. Hufgard, Novelty, both of Ohio, assignors to Bessam-Aire, Inc., Cleveland, Ohio

Filed Mar. 26, 1986, Ser. No. 844,326
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—227 **20 Claims**



1. Apparatus for cleaning, cooling and humidifying gas comprising,

means forming a chamber having an inlet and an outlet,

a first foraminous wall extending across the inlet to filter large solid particles from gas entering the chamber through the inlet,

an open top water reservoir in the bottom of the chamber adjacent the first foraminous wall, said reservoir being filled with water to a predetermined level,

two means for controlling the water level,

an electric motor in the chamber mounted above the water level adjacent the first foraminous wall, said motor having a rotable shaft projecting away from said first foraminous wall at an upwardly extending angle of about 3°,

a disc mounted on the end of the shaft most remote from the first foraminous wall, said disc having a diameter sufficiently great as to extend below the surface of the water and, upon rotation of said shaft, to fling droplets of water from the reservoir upwardly to form a wet curtain of water droplets across the chamber generally paralle to said wall and thereby clean, cool and humidify gas passing from the inlet to the outlet,

means for adjusting the size of the water droplets flung from the disc,

means for pulling gas from the inlet through the outlet,

second and third foraminous walls extending across the chamber between the disc and the outlet,

the second foraminous wall being nearest the disc and serving to filter large water droplets from the gas moving toward the outlet,

the third foraminous wall being spaced from this second foraminous wall and farthest from the disc,

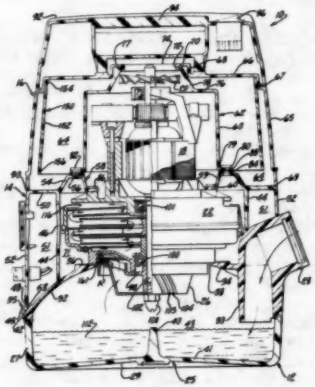
both the second and third foraminous walls being supported on a surface sloping downwardly toward said reservoir whereby water droplets trickling down the second and third foraminous walls will flow down the sloping surface and return to the reservoir.

4,640,697

VACUUM CLEANER CONSTRUCTION

Roy O. Erickson, Jr., Cadillac, Mich., assignor to Rexair, Inc., Troy, Mich.

Filed Oct. 1, 1985, Ser. No. 782,509
Int. Cl.[4] B01D *47/02*
U.S. Cl. 55—248 **8 Claims**



1. A liquid bath vacuum cleaner comprising a pan assembly adapted to contain a liquid bath including inlet means for enabling ingress of cleaning air into said vacuum cleaner and having an outer wall and a wall extending radially inwardly from said outer wall forming an opening at the top of the pan assembly, a main housing operably associated with said pan assembly, said main housing including a main housing cavity including outlet means for enabling egress of cleaning air from said main housing cavity and said vacuum cleaner, a cap assembly operably associated with said main housing, said cap assembly including a cap assembly cavity, an inner canister positioned within said cap assembly, a motor assembly mounted within said inner canister, baffle means positioned within said cap assembly and surrounding said inner canister for reducing vacuum noise while enabling cooling air to pass through said cap assembly cavity, means for drawing cooling air into said cap assembly associated with said motor, means for enabling

cooling air to egress from said inner canister into said cap assembly cavity, means for enabling cooling air to egress from said cap assembly cavity and said vacuum cleaner, means for dividing said main housing assembly from said cap assembly including an opening, means for separating said main housing cavity from said cap assembly cavity, said separating means including a support ring associated with and secured to said dividing means, and a fan housing assembly, including a fan, positioned within said main housing cavity and associated with and secured to said support ring at said dividing means opening, means for establishing a seal between said fan housing assembly and said radially inwardly extending wall, and a separator for drawing cleaning air into said pan assembly and separating said cleaning air from liquid droplets.

4,640,698

AIR CLEANER DEVICE

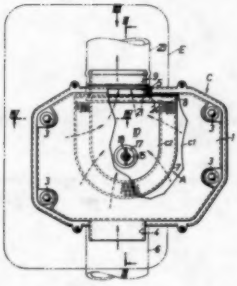
Toshio Ohishi, Sagamihara, and Yohji Kurotobi, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,631

Claims priority, application Japan, May 21, 1984, 59-74225[U]

Int. Cl.⁴ B01D *46/00*

U.S. Cl. 55—502 **8 Claims**



1. An air cleaner device comprising

(a) a cleaner case;

(b) a cleaner assembly means disposed in said cleaner case and dividing the space in said cleaner case into an uncleaned air chamber outside the assembly means and a cleaned air chamber inside the assembly means, said cleaner assembly means comprising

(i) a cleaner element;

(ii) a holder means affixed to said cleaner case for holding said cleaner element; and

(iii) seal means, connected to said holder means, for hermetically sealing said cleaned air chamber, said seal means being adapted for connection to an air intake system; wherein said seal seal means comprises a seal joint, and seal ring positioned between said seal joint and said holder means, said seal joint providing a hermetic seal of the cleaned air chamber against outside;

(c) said cleaner case consisting of an upper half part and a lower half part which are coupled to each other at peripheral edge portions thereof, and wherein a hole is provided at a mating part of the peripheral edge portions of said upper and lower half parts, said seal joint being fitted into said hole of the cleaner case.

4,640,699

PROCESS FOR PRODUCING GLASS PRODUCT HAVING GRADIENT OF REFRACTIVE INDEX

Shigeaki Ohmi, Tokorozawa; Seiichi Shingaki; Hiroyuki Sakai, both of Akishima, and Yoshiyuki Asahara, Higashiyamato, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Continuation of Ser. No. 488,809, Apr. 26, 1983, Pat. No. 4,525,189. This application Apr. 3, 1985, Ser. No. 719,569

Claims priority, application Japan, May 14, 1982, 57-80124

The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.⁴ C03B *25/02*

U.S. Cl. 65—3.15 **9 Claims**

1. A process for producing a glass product having a gradient of refractive indices and transparent without turbidity which comprises:

(a) producing a porous glass body by:

(1) heating a glass body to effectuate a phase separation;

(2) leaching out the acid-soluble phase from said glass body; and then

(3) recovering therefrom the porous glass body;

(b) premeating a solution of dopant into the micropores of said porous glass product wherein said dopant is selected from the group consistin of (1) $TlNO_3$, the concentration of $TlNO_3$ in the dopant solution being about 80 g/100 ml of H_2O or less, (2) $TlNO_3$ and an alkali metal compound, the concentration of $TlNO_3$ in the dopant solution being about 100 to 400 g/100 ml of H_2O, and (3) $TlNO_3$, $Pb(NO_3)_2$ and an alkali metal compound, the concentration of $TlNO_3$ in the dopant solution being about 100 to 400 g/100 ml of H_2O,

(c) leaching out a portion of the dopant from the micropores with or without solidifying the dopant in the micropores to form a concentration gradient of the dopant in said porous glass product;

(d) solidifying the dopant in the micropores,

(e) drying the porous glass product,

(f) heat treating said porous glass product to collapse the micropores, and

(g) recovering a glass having Δn greater than 0.04 wherein Δn is the difference between the central and peripheral portions of the glass.

4,640,700

METHOD FOR ATTACHING A STUD PIN TO A CATHODE RAY TUBE PANEL

Shinzo Takei, Tokyo; Junji Yokoyama, Kanagawa, and Makoto Takagi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,428

Claims priority, application Japan, Jul. 4, 1984, 59-138789

Int. Cl.⁴ C03C *27/02*

U.S. Cl. 65—59.22 **3 Claims**

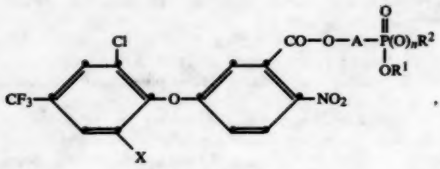
1. A method for attaching a stud pin to an inside wall portion of a cathode ray tube panel using a frit slurry which consists of a crystalizing solder glass containing lead oxide, a binder comprising nitrocellulose and a solvent, characterized in that said solvent is an ester alcohol having a viscosity of higher than 10 cps and a boiling point ranging from 200° C. to 320° C., whereby said slurry has a slow drying property and high viscosity.

4,640,701
HERBICIDAL PHOSPHONIC ACID AND PHOSPHINIC ACID DERIVATIVES

Peter J. Diel, Riehen, and Ludwig Maier, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 8, 1985, Ser. No. 720,784
Claims priority, application Switzerland, Apr. 17, 1984, 1946/84
Int. Cl.[4] A01N 57/06; C07F 9/40, 9/32
U.S. Cl. 71—86 18 Claims

1. A phosphonic acid or phosphinic acid derivative of the formula



wherein
X is hydrogen,
n is 0 or 1,
R^1 and R^2 are each independently hydrogen or C_1–C_4alkyl and
A is a C_1–C_3alkyl chain which may be substituted by one or two C_1–C_2alkyl radicals, with the proviso that R^2 is not hydrogen if n is 0.

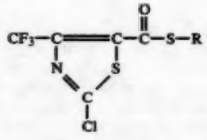
2. A herbicidal composition which contains, as active ingredient, a phosphonic acid or phosphinic acid derivative of formula I according to claim 1, together with inert adjuvants.

4,640,702
2-CHLORO-4-TRIFLUOROMETHYL-THIAZOLECARBOTHIOIC ACIDS USEFUL AS HERBICIDAL SAFENERS

Raymond C. Grabiak, Creve Coeur; Robert K. Howe, Bridgeton, and David E. Schafer, Olivette, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 14, 1980, Ser. No. 168,959
Int. Cl.[4] A01N 43/78; C07D 277/34
U.S. Cl. 71—90 34 Claims

6. A method of reducing herbicidal injury to sorghum plants due to application thereto of 2-haloacetanilide herbicides which comprises applying to the plant locus a non-phytotoxic, safening effective amount of a compound having the formula



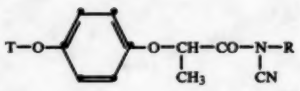
wherein R is C_{1-5} alkyl, phenyl or benzyl.

4,640,703
2-PHENOXYPROPIONIC ACID CYANAMIDES AS HERBICIDES

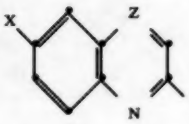
Beat Böhner, Binningen; Hermann Rempfler, Ettingen, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 30, 1984, Ser. No. 676,962
Claims priority, application Switzerland, Dec. 6, 1983, 6509/83; Apr. 18, 1984, 1948/84
Int. Cl.[4] C07D 241/44; A01N 43/60, 43/40, 43/76
U.S. Cl. 71—92 16 Claims

1. A 2-phenoxypropionic acid cyanamide of the formula

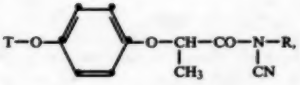


wherein
R is hydrogen, C_1–C_4alkyl, C_3–C_4alkenyl, C_3–C_4alkynyl or C_2–C_4alkoxyalkyl, and
T is a quinoxalinyl radical of the formula

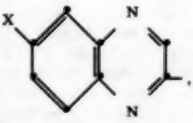


wherein
X is fluorine, chlorine, bromine, iodine or trifluoromethyl, and
Z is nitrogen.

4. A herbicidal composition which comprises, as active ingredient, 0.1 to 80% of a 2-phenoxypropionamide of the formula



wherein
R is hydrogen, C_1–C_4alkyl, C_3–C_4alkenyl, C_3–C_4alkynyl or C_2–C_4alkoxyalkyl, and
T is a quinoxalinyl radical of the formula



wherein X is fluorine, chlorine, bromine, iodine or trifluoromethyl, in combination with conventional carriers or other adjuvants.

4,640,704

HERBICIDAL SULFONAMIDES

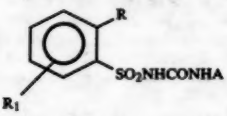
Chi-wan Chen, Silver Spring, Md., and Gregory W. Schwing, Lincoln University, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 637,580, Aug. 3, 1984, Pat. No. 4,582,525, which is a continuation-in-part of Ser. No. 168,346, Jul. 11, 1980, abandoned. This application Oct. 22, 1985, Ser. No. 790,305

Int. Cl.[4] C07D *239/70;* A01N *47/36*

U.S. Cl. 71—92 10 Claims

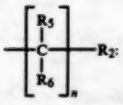
1. A compound selected from



I

wherein

R is



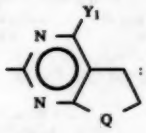
R_2 is C_2–C_5 alkenyl, C_5–C_6 cycloalkenyl or C_2–C_3 alkenyl substituted with 1–3 chlorine atoms;

n is 0 or 1;

R_1 is H, F, Cl, Br, NO_2, CF_3, C_1–C_4 alkyl, OCF_3 or C_1–C_3 alkoxy;

R_5 and R_6 are independently H or CH_3;

A is



Y_1 is H, CH_3, OCH_3 or Cl; and

Q is CH_2.

4,640,705

METHOD FOR COMBATTING BLACKGRASS IN CEREAL CROPS AND COMPOSITIONS THEREFOR

Julian Gabe, Rehovot, Israel, and Richard J. Makepeace, Lower Heyford, United Kingdom, assignors to Agan Chemical Manufacturers Ltd., Israel

Filed Jul. 6, 1983, Ser. No. 511,513

Claims priority, application Israel, Jul. 7, 1982, 66255; Jul. 21, 1982, 66359

Int. Cl.[4] A01N *43/70*

U.S. Cl. 71—93 10 Claims

1. A method for obtaining satisfactory blackgrass control in cereal crops, without injury to the cereal crops, comprising preemergent application of a mixture consisting essentially of terbutryne and trifluralin having a ratio of 1:2 to 2.5:1 in sufficient amount to control the blackgrass and yet not injure the crops at a rate of application of the mixture from 1.0 to 4.5 kilogram per hectar.

4,640,706

CYCLOHEXENONECARBOXYLIC ACID DERIVATIVES WITH HERBICIDAL AND PLANT GROWTH REGULATING PROPERTIES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

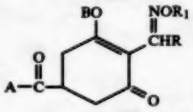
Filed Mar. 20, 1985, Ser. No. 714,133

Claims priority, application Switzerland, Mar. 30, 1984, 1613/84

Int. Cl.[4] A01N *31/06, 33/24;* C07C *131/08*

U.S. Cl. 71—94 7 Claims

1. A cyclohexenonecarboxylic acid derivative of formula I



(I)

wherein

A is $—NR_3R_4$,

R is C_1–C_6alkyl or C_3–C_6cycloalkyl, each unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio,

R_1 is C_1–C_6alkyl, C_1–C_6haloalkyl, C_3–C_6alkenyl, C_3–C_6haloalkenyl or C_3–C_6alkynyl,

R_3 is hydrogen; C_1–C_6alkyl, C_1–C_6haloalkyl, C_2–C_{10}alkoxyalkyl, C_2–C_{10}alkylthioalkyl; or is C_3–C_6alkenyl which is unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio; or is C_3–C_6alkynyl; or is phenyl or benzyl, the phenyl nucleus of which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, nitro or cyano,

R_4 is C_1–C_4alkoxy or has the same meaning as R_3, or

R_3 and R_4 together with the nitrogen atom to which they are attached are also a saturated 5- or 6-membered heterocycle, B is $—COR_5$, and

R_5 is C_1–C_6alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl, or also phenyl or benzyl which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, nitro or cyano.

4. A herbicidal and plant growth regulating composition which comprises an effective amount of a cyclohexenonecarboxylic acid derivative according to claim 1, together with a carrier or other adjuvants.

4,640,707

TETRAHYDROPHTHALIMIDES AND THEIR HERBICIDAL USE

Eiki Nagano, Nishinomiya; Toru Haga, Takarazuka; Ryo Sato, and Kouichi Morita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

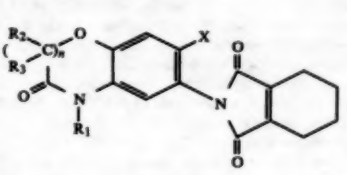
Filed Jul. 18, 1985, Ser. No. 756,251

Claims priority, application Japan, Jul. 23, 1984, 59-152721; Aug. 3, 1984, 59-164020; Sep. 20, 1984, 59-198245

Int. Cl.[4] A01N *43/76, 43/84;* C07D *413/02*

U.S. Cl. 71—96 23 Claims

1. A compound of the formula:



wherein R_1 is a hydrogen atom, a C_1–C_5 alkyl group, a C_{3-C_4} alkenyl group, a C_3–C_4 alkynyl group, a C_1–C_4 haloalkyl group, a C_3–C_4 haloalkenyl group, a C_3–C_4 haloalkynyl group, a C_1–C_2 alkoxy(Chd 1–C_2)alkyl group or a C_1–C_2 alkoxy(C-

$_1$–C_2)alkoxy(C_1–C_2)alkyl group, R_2 and R_3 are, the same or different, each a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group or a phenyl group, X is a hydrogen atom, a chlorine atom or a fluorine atom and n is an integer of 0 or 1.

19. A method for exterminating harmful weeds which comprises applying as an active ingredient a herbicidally effective amount of the compound according to claim 1 to the area where the weeds grow or will grow.

4,640,708
HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir, and Keith G. Watson, Box Hill North, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

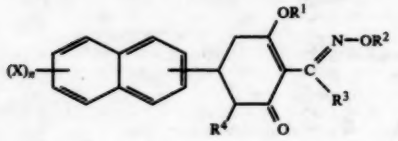
Filed Mar. 20, 1984, Ser. No. 591,372

Claims priority, application Australia, Apr. 7, 1983, PF8781; May 5, 1983, PF9189

Int. Cl.[4] **A01N** *31/08, 33/04;* **C07C** *131/00*

U.S. Cl. 71—98 **9 Claims**

1. A compound of formula I



I

wherein:

X, which may be the same or different, are independently selected from the group consisting of: C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, halogen, nitro, sulfamoyl, N—(C_1 to C_6 alkyl)sulfamoyl, N,N-di(C_1 to C_6 alkyl)sulfamoyl, formyl, C_2 to C_6 alkanoyl, and the group of the formula $—C(R^7)=NR^8$ wherein R^7 is selected from hydrogen and C_1 to C_5 alkyl and R^8 is selected from hydroxy and C_1 to C_6 alkoxy;

R^1 is selected from the group consisting of: hydrogen; C_2 to C_6 alkanoyl; benzoyl and substituted benzoyl wherein the benzene ring is substituted with from one to three substitutents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; benzenesulfonyl and substituted benzenesulfonyl wherein the benzene ring is substituted with from one to three substituents selected from the group consisting of halogen, nitro, C_1 to C_6 alkyl and C_1 to C_6 alkoxy; and an inorganic or an organic cation selected from the alkali metals, the alkaline earth metals, the transition metals, the ammonium ion and the tri- and tetra-(alkyl)ammonium ions wherein alkyl is selected from C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl;

R^2 is selected from the group consisting of: C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkynyl, C_1 to C_6 haloalkyl, C_2 to C_6 haloalkenyl and C_2 to C_6 haloalkynyl;

R^3 is selected from C_1 to C_6 alkyl;

R^4 is selected from hydrogen, halogen and (C_1 to C_6 alkoxy)-carbonyl; and

n is zero or an integer selected from 1 to 3.

6. A herbicidal composition comprising as active ingredient an effective amount a compound as defined according to claim 1 and a carrier therefor.

4,640,709
HIGH CONCENTRATION ENCAPSULATION BY INTERFACIAL POLYCONDENSATION

George B. Beestman, St. Louis County, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 12, 1984, Ser. No. 619,752

Int. Cl.[4] **A01N** *37/18, 37/22;* **B01J** *13/02*

U.S. Cl. 71—100 **18 Claims**

1. A process of encapsulating water-immiscible material within a shell wall of polymeric material which comprises:

(a) providing an aqueous phase containing an emulsifier which is an water-soluble alkylated polyvinyl pyrrolidone polymer which forms an oil-in-water emulsion;

(b) dispersing in said aqueous phase a water-immiscible phase consisting essentially of a first shell wall component dissolved in said water-immiscible material, to form a dispersion of water-immiscible phase droplets throught the aqueous phase;

(c) adding, with agitation, to said dispersion a second shell wall component whereby said second shell wall component reacts with said first shell wall component to form a polymeric shell wall about said water-immiscible material wherein the concentration of said water-immiscible material is from about 480 to about 700 grams per liter of composition.

11. A composition consisting essentially of microcapsules suspended in an aqueous liquid said microcapsules being comprised of a water-immiscible material contained within an encapsulating wall of polymeric material wherein:

(a) the concentration of said water-immiscible material is from about 480 grams to about 700 grams per liter of composition;

(b) wherein said encapsulating wall of polymeric material is the reaction product of a first shell wall component which is a difunctional or polyfunctional reactant that is soluble in said water-immiscible material and a second shell wall component which is water soluble and which is a difunctional or polyfunctional reactant and wherein the concentration of said first shell wall component is from about 3.5% to about 21.0% relative to the weight of said water-immiscible material and wherein the concentration of said second shell wall component is from about 1.5% to about 9.0% relative to the weight of said water-immiscible material; and

(c) wherein said water contains from about 0.5% to about 15% of an emulsifier relative to the weight of said water-immiscible material, said emulsifier being an water-soluble alkylated polyvinyl pyrrolidone polymer which is capable of forming an oil-in-water emulsion.

15. A composition as described in claim 11 wherein said water-immiscible material is an herbicide, insecticide, plant growth regulant or an herbicidal antidote.

4,640,710
PROCESS FOR RECOVERING SILVER FROM SULFATE SOLUTIONS

Didier Beutier, Paris, and Jean-Jacques Predali, Elancourt, both of France, assignors to Societe Miniere et Metallurgique de Penerroya, Paris, France

Filed Dec. 6, 1984, Ser. No. 678,998

Claims priority, application France, Dec. 9, 1983, 83 19825

Int. Cl.[4] **C22B** *11/04*

U.S. Cl. 75—108 **8 Claims**

1. A process for recovering silver in sulfuric solutions having a pH less than 4 and a temperature between 50° and 80° C., which comprises adjusting the redox potential of the solutions to the equilibrium value with sphalerite and contacting said silver solutions with a quantity of zinc sulfide which is at least equal to the stoichiometric quantity of silver in said solutions and the surface area of which is at least equal to $K\,Ag^I \times V$, Ag being the concentration of silver in the solution expressed in kilograms per cubic meter and V the volume of the solution in cubic meters, the surface area being expressed in square meters

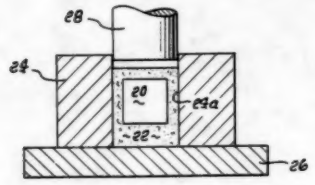
and the value of K being greater than or equal to approximately 10.

4,640,711

METHOD OF OBJECT CONSOLIDATION EMPLOYING GRAPHITE PARTICULATE

Wayne P. Lichti, Lakewood, and Alfred F. Hofstatter, Dana Point, both of Calif., assignors to Metals Ltd., Newport Beach, Calif.

Continuation-in-part of Ser. No. 535,791, Sep. 26, 1983, Pat. No. 4,539,175. This application May 10, 1985, Ser. No. 732,683
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—248 37 Claims



1. The method of consolidating a metallic, metallic and ceramic, or ceramic body in any of initially powdered, sintered, fibrous, sponge, or other form capable of compaction, that includes the steps:

(a) providing a bed of flowable particles within a contained zone, said particulate primarily consisting of flowable and resiliently compressible carbonaceous particles, in the form of beads having outwardly projecting nodules thereon, and at least some beads having surface fissures,

(b) positioning said body in said bed,

(c) and effecting pressurization of said bed to cause pressure transmission via said particles to said body, thereby to compact the body into desired shape, increasing its density,

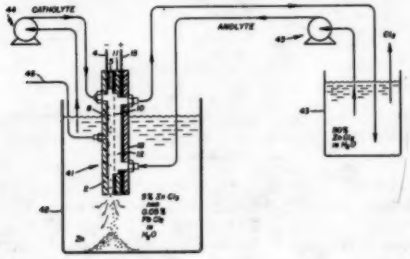
(d) said body and bed being at elevated temperatures prior to said pressurization step.

4,640,712

IMPURE ZINC POWDER, PREPARATION THEREOF, AND USE AS A SELECTIVE REDUCTANT FOR PENTACHLOROPYRIDINE

Theodore J. Sobieralski, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,329
Int. Cl.[4] B22F *1/00*; C22C *18/00*
U.S. Cl. 75—251 3 Claims



1. An impure zinc powder of which the particles consist of zinc, from about 5,000 to about 30,000 parts of lead and less than 5 parts of other materials per million parts of zinc.

4,640,713

TARNISH REMOVER/METAL POLISH FORMULATION COMPRISING A METAL IODIDE, AN ACID, AND WATER

Robert B. Harris, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 19, 1984, Ser. No. 672,966
Int. Cl.[4] C09G *1/04, 1/06*
U.S. Cl. 106—3 17 Claims

1. An improved tarnish remover/metal polish formulation comprising:

(a) at least one metal iodide in an amount of from about 8 to 25% by weight;

(b) an acid in an amount of from about 0.1 to 25% by weight;

(c) a surfactant in an amount of from about 0.5 to 3% by weight, and;

(d) the balance water.

4,640,714

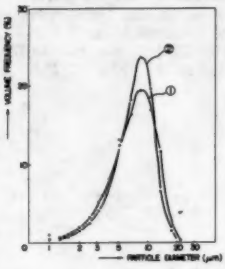
ALCOHOL-BASED FLEXOGRAPHIC INK FOR USE IN BACKCARBON PAPERS

Nobuhiro Kagota, and Hideaki Senoh, both of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,276
Claims priority, application Japan, Aug. 24, 1983, 58-155497
Int. Cl.[4] C09D *11/12*
U.S. Cl. 106—21 11 Claims

1. An alcohol-based flexographic ink for use in colorless backcarbon papers which is composed essentially of (A) microcapsules whose core substance is an oil droplet containing an electron-donating organic color former, (B) microcapsules whose core substance is an oil droplet containing an electron-

accepting organic color developer, (C) a binder resin and (D) a solvent composed mainly of a lower alcohol of 1 to 3 carbon



atoms, characterized in that either or both of the core substances of the microcapsules (A) and (B) contain a wax.

4,640,715

MINERAL BINDER AND COMPOSITIONS EMPLOYING THE SAME

Richard E. Heitzmann, Pearland; Mark Fitzgerald, Houston, and James L. Sawyer, Friendswood, all of Tex., assignors to Lone Star Industries, Inc., Greenwich, Conn.

Filed Mar. 6, 1985, Ser. No. 708,732
Int. Cl.[4] C04B 7/00
U.S. Cl. 106—85 13 Claims

1. A dry, mineral binder composition for binding mineral materials comprising:
from about 6 to 25 parts by weight metakaolin
from about 3 to 30 parts by weight dry potassium hydroxide
from 0 to 18 parts by weight slag
from 0 to 60 parts by weight of at least one material selected from the class consisting of fly ash, calcined shale, and calcined clay
from 1 to 150 parts of an amorphous silica.

4,640,716

HIGH BULKING PIGMENT AND METHOD OF MAKING SAME

Andrew J. Cleland, Somerset, N.J., assignor to Engelhard Corporation, Menlo Park, N.J.

Filed Jun. 26, 1985, Ser. No. 748,899
Int. Cl.[4] C08L 89/00; C08J 3/00; C04B 14/00
U.S. Cl. 106—161 34 Claims

1. A pigment comprising a zirconium-treated uncalcined kaolin clay made by combining the clay with an added source of zirconium ion under conditions including the absence of deleterious amounts of a binder and the presence of at least a sufficient amount of the zirconium ion source to enhance the optical character of a substrate containing the dry pigment.

4,640,717

SUGAR PROCESS

Dipak P. Shukla, Reading; Keith Sinclair, Paddock Wood, and Kevin A. Smith, Reading, all of England, assignors to Tate & Lyle Public Limited Company, London, England

Filed Mar. 15, 1985, Ser. No. 712,256
Claims priority, application United Kingdom, Mar. 15, 1984, 8406734
Int. Cl.[4] C13F 1/02
U.S. Cl. 127—58 10 Claims

1. In the process for the crystallisation of sucrose or glucose from a supersaturated sugar syrup comprising subjecting the syrup to shear in an uncooled nucleation zone to induce nucleation of the syrup, discharging the syrup from said nucleation zone before substantial crystallisation has taken place, and allowing the syrup to crystallise without agitation, the improvement which comprises providing the shear by a continuous screw extruder to induce progressive nucleation of the syrup at an average retention time in said screw extruder of less than 25 seconds and a temperature of 115° to 145° C. for sucrose and 100–135° C. for glucose.

4,640,718

PROCESS FOR ACCELERATING PD/SN SEEDS FOR ELECTROLESS COPPER PLATING

Patrick R. Alnot, Toul, France; Daniel J. Auerbach, San Jose, Calif.; Christopher R. Brundle, San Jose, Calif., and Dolores C. Miller, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1985, Ser. No. 792,425
Int. Cl.[4] C23C 16/06
U.S. Cl. 134—2 5 Claims

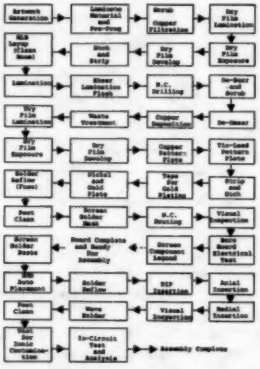
1. A process for accelerating Pd/Sn seeds to be used for electroless copper plating, said process comprising
treating said seeds with an aqueous solution of alkali metal hydroxide at a pH of about 11.3 and at a temperature of above 50° C., thereby selectively removing Sn from the surface of the seeds and leaving the Pd.

4,640,719

METHOD FOR PRINTED CIRCUIT BOARD AND/OR PRINTED WIRING BOARD CLEANING

Michael E. Hayes; Craig C. Hood; Ronald E. Miller, and Robert Sharpe, all of Fernandina Beach, Fla., assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Filed Jul. 1, 1985, Ser. No. 750,198
Int. Cl.[4] C23G 1/00
U.S. Cl. 134—40 9 Claims



1. A method for removing rosin soldering flux or adhesive tape residues from a printed wiring board, comprising
(a) contacting the board with a composition comprising a terpene compound and from 0 to about 40% by weight of a terpene emulsifying surfactant;
(b) allowing the contact to continue for sufficient time to solubilize the soldering flux or tape residues; and
(c) removing the composition and solubilized soldering flux or tape residues from the board.

4,640,720

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

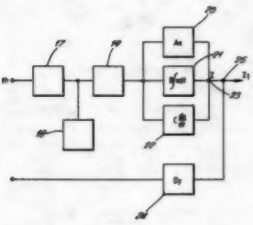
Charles T. Foxon, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

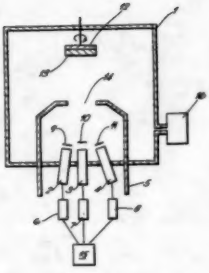
Filed Apr. 22, 1985, Ser. No. 725,888

Claims priority, application United Kingdom, May 14, 1984, 8412275

Int. Cl.[4] H01L *21/203, 21/302*

U.S. Cl. 148—175 5 Claims





1. In a method of manufacturing a semiconductor device, the method comprising the steps of providing a monocrystalline substrate in a deposition chamber of a molecular beam epitaxy apparatus, reducing pressure in the deposition chamber to below atmospheric pressure, heating the substrate, causing a plurality of successive combinations of molecular beams to be indicident on the substrate so as to form a plurality of epitaxial layers, wherein the molecular beams each comprise a constituent element of the respective layer material and each beam emanates from a separate source when a shutter associated with the respective source has been opened, the improvement comprising the steps of increasing the rate of input of heat to that source when the shutter of that source is opened, said increase being of a predetermined value so that the temperature of that source does not change substantially as a result of the opening of the shutter, and reducing the rate of input of heat to that source when the said shutter is closed, said reduction being of said predetermined value.

4,640,721

METHOD OF FORMING BIPOLAR TRANSISTORS WITH GRAFT BASE REGIONS

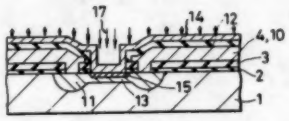
Keijiro Uehara, Sagamihara; Hisayuki Higuchi, Kokubunji, and Akio Hayasaka, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,525

Claims priority, application Japan, Jun. 6, 1984, 59-114562; Jun. 6, 1984, 59-114563

Int. Cl.[4] H01L *21/385*

U.S. Cl. 148—188 15 Claims



1. A method of producing a semiconductor device comprising the steps of:

(a) stacking and forming on a semiconductor substrate of a first conductivity type a first silicon dioxide film, a first silicon nitride film, a first polycrystalline silicon film heavily doped with an impurity of a second conductivity type, and a second silicon nitride film,

(b) removing desired parts of said second silicon nitride film and said first polycrystalline silicon film, to expose a desired part of said first silicon nitride film,

(c) oxidizing an end part of said first polycrystalline film from an exposed side part thereof, to form a silicon dioxide film of desired width in contiguity to a side part of said first polycrystalline silicon film,

(d) selectively forming a second polycrystalline silicon film on a surface of the structure formed in step (c), so as to be formed over the silicon dioxide film of desired width,

(e) successively removing said second silicon nitride film, so as to expose said silicon dioxide film of desired width, said silicon dioxide film of desired width, and parts of said first silicon nitride film underlying said silicon dioxide film,

(f) removing said second polycrystalline silicon film,

(g) removing exposed parts of said first silicon dioxide film, to form an opening,

(h) forming a third polycrystalline silicon film on a surface of the resultant structure of step (g), so as to extend continuously from said opening to being in contact with the first polycrystalline silicon film,

(i) heating the resultant structure, to diffuse the impurity contained in said first polycrystalline silicon film into a desired part of said third polycrystalline silicon film and simultaneously to diffuse the impurity into said semiconductor substrate through said opening, so as to form a graft base, and

(j) successively doping a surface region of said semiconductor substrate with an impurity of the second conductivity type and an impurity of the first conductivity type to form an intrinsic base and an emitter.

4,640,722

HIGH TEMPERATURE FERRITIC STEEL

Mark D. Gorman, Lebanon, Ohio, assignor to Armco Inc., Middletown, Ohio

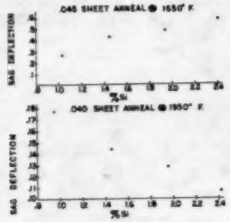
Continuation-in-part of Ser. No. 560,129, Dec. 12, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 704,752

Int. Cl.[4] C22C *38/26, 38/28*

U.S. Cl. 148—325 11 Claims

1. Annealed ferritic steel exhibiting improved cyclic oxidation resistance and creep strength at temperatures of at least 816° C., after a final anneal at 1010° to 1120° C. which develops a columbium-silicon rich Laves phase, consisting essentially of, in weight percent, 0.05% maximum carbon, about 2% maximum manganese, greater than 1.0% to about 2.25% silicon,

less than 0.5% aluminum, with the silicon content being at least 3 times the aluminum content, about 6% to about 25% chromium, up to about 5% molybdenum, with the sum of chromium and molybdenum being at least 8%, 0.05% maximum nitrogen, at least one of titanium, zirconium and tanalum, with



said titanium, zirconium and tantalum being present in an amount at least equal to the stoichiometric equivalent of the percent carbon plus the percent nitrogen, about 0.3% maximum total columbium with at least 0.1% uncombined columbium, and balance essentially iron.

4,640,723

LEAD FRAME AND METHOD FOR MANUFACTURING THE SAME

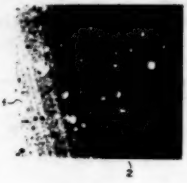
Shinzo Sugai, Chigasaki; Shigemi Yamane, and Takashi Kuze, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 20, 1983, Ser. No. 563,445

Claims priority, application Japan, Dec. 23, 1982, 57-230402

Int. Cl.[4] C22D *1/08*

U.S. Cl. 148—411 **3 Claims**



3. A lead frame comprising a copper alloy containing 0.1 to 1% by weight of chromium and 0.001 to 0.5% by weight of zirconium and having a precipitate with a grain size from 0.5 to 50 μm distributed therein at a rate of 1,000 to 10,000 grains/mm^2, wherein the copper alloy further contains not more than 1% by weight of at least one member selected from the group consisting of magnesium, silicon, tin, nickel, iron, zinc, manganese, phosphorus, boron, silver, beryllium, cobalt, titanium and yttrium, said copper alloy being formed by the sequential steps of continuously casting the alloy, rolling the cast alloy, solution treating the alloy, cold working the alloy, and age-hardening the alloy.

4,640,724

METHODS OF PRIMING EXPLOSIVE DEVICES

George B. Carter, Lichfield, and Alan P. Manby, Amington, both of England, assignors to IMI Kynoch Limited, Birmingham, England

Filed Mar. 20, 1981, Ser. No. 245,972

Claims priority, application United Kingdom, Apr. 19, 1980, 8012963

Int. Cl.[4] C06B *41/06*; F42B *33/02*

U.S. Cl. 149—109.6 **11 Claims**

1. A method of priming a rimfire cartridge by providing in the rim thereof a quantity of primer comprising a primary explosive compound, said method comprising, in the recited order, the steps of:

(a) dosing into the rimfire case a quantity of a substantially dry, powdery, relatively insensitive premix comprising, in predetermined proportions, at least two materials that will, in the presence of a liquid reaction medium, react together forming said primary explosive compound,

(b) compacting the premix so as substantially to fill the rim of the case therewith,

(c) dosing a quantity of said liquid reaction medium into said case so as to cause said materials to react together forming the primary explosive compound, and

(d) drying the primer.

4,640,725

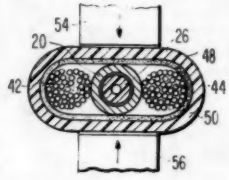
METHOD OF FORMING FIBER OPTIC CABLE TERMINATION

Theodore L. Jones, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 9, 1985, Ser. No. 785,790

Int. Cl.[4] B32B *31/04, 31/20*

U.S. Cl. 156—85 **4 Claims**



1. A method for forming a termination of a fiber optic cable with a electro-optic component housing wherein

the fiber optic cable is comprised of an optical fiber, a plurality of reinforcement strands aligned about the length of the optical fiber, and a jacket positioned about the reinforcement strands, and

the electro-optic component housing has an interior compartment, a tubular extension of a predetermined length with a passage in communication with the interior compartment, and an outer diameter surface, said method comprising the steps of:

(a) removing a terminal portion of the jacket which is at least as long as the predetermined length of the tubular extension, thereby exposing a length of optical fiber and lengths of reinforcement strands at one end of the jacket on the fiber optic cable;

(b) inserting the exposed length of optical fiber into and through the passage to the interior compartment of the component housing;

(c) positioning the exposed reinforcement strands about the outer diameter surface of the tubular extension so as to cover only portions of the outer diameter and leave the remaining portions of the outer diameter exposed;

(d) providing a layer of adhesive over the strands, the exposed portions of the outer diameter and an end portion of the jacket;

(e) positioning a length of a heat-shrink tubing about the tubular extension and the jacket; and

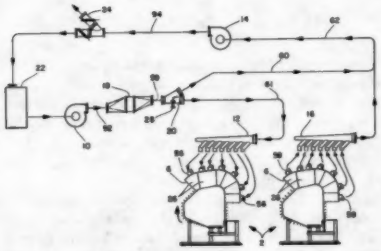
(f) heating the heat-shrink tubing to a temperature sufficient to reduce the diameter of the tubing so as to cause the layer of adhesive to adhesively engage the strands, the exposed areas of the tubular extension, the end portion of the jacket and the heat-shrink tubing.

4,640,726

HEAT ACTIVATION PROCESS AND APPARATUS FOR HEAT SHRINKABLE MATERIAL

Lorry F. Sallee, Pine River, and Robert L. Popp, Hortonville, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 27, 1985, Ser. No. 749,170
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—85 **25 Claims**



1. An apparatus for heating selected portions of an article, comprising:

(a) transport means for moving said article into a heating compartment;

(b) shroud means disposed within said heating compartment for directing a stream of heated gas toward a selected portion of the article;

(c) supply means for delivering a volume rate of flow of said heated gas to said shroud means; and

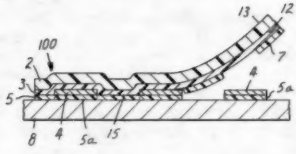
(d) discharge means for removing a volume rate of exhaust gas flow from said heating compartment, said discharge means constructed and arranged to provide a volume rate of exhaust gas flow from said heating compartment which is greater than the volume rate of heated gas flow supplied into said shroud means and to provide a cooling gas flow past article portions which are not targeted for heating.

4,640,727

GRAPHIC DESIGN ARTICLE

Jeffrey R. Janssen, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 28, 1985, Ser. No. 695,693
Int. Cl.[4] B44C *1/00*; B41M *3/12*; B32B *3/00*
U.S. Cl. 156—240 **31 Claims**



1. A dry article for transferring a graphic design to a substrate comprising

(a) a carrier which is transparent to actinic radiation;

(b) an actinic radiation transmissive first adhesive layer on said carrier, which first adhesive layer presents a major surface having first and second surface portions thereon;

(c) a graphic design on said first surface portions which is opaque to actinic radiation; and

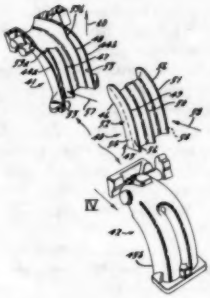
(d) a continuous actinic radiation responsive second adhesive layer which covers said graphic design and said second portions of said first adhesive layer; wherein, upon a single exposure of said article to actinic radiation through said carrier and application of said article to said substrate and removal of said carrier, said first adhesive layer and said second adhesive layer on said second surface portions of said first adhesive layer are selectively removed from said substrate leaving only said graphic design and said second adhesive layer in registry therewith on said substrate.

4,640,728

METHOD OF JOINING FOAM PATTERNS FOR EVAPORATIVE CASTING PROCESS

Robert A. Martin, Northville, and Thomas J. Heater, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 772,817, Sep. 5, 1985. This application Jun. 23, 1986, Ser. No. 877,595
Int. Cl.[4] B32B *31/04*; B22C *7/02*
U.S. Cl. 156—245 **2 Claims**



1. A method of assembling foam pattern segments into a unitary assembly, comprising:

(a) molding first, second and thrid consumable foam pattern segments, said first and second pattern segments being mateable and effective to meet along exteriorly disposed jont margins defined by mateable surfaces extending along opposite sides of each of said first and second segments, and a third pattern segment nestable totally within the assembly of said first and second segments and nestable without joint margins exposed to the exterior of the mated asssembly, said first and third segments being molded with interiorly disposed pilot surfaces effective to constitute a double-ply foam wall when mated, said first and third segments being molded with interiorly disposed second pilot surfaces effective to constitute a double-ply foam wall when mated, said pilot surfaces also having stop means to limit movement of the pilot surfaces;

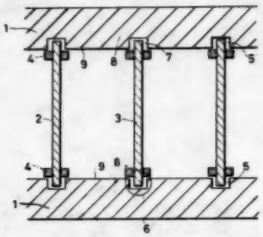
(b) mating said first segment with said third segment by moving said first pilot surfaces together along the plane of said surfaces until said stop means is bottomed out; and

(c) mating said second segment with the assembly of said third and first segments by moving said second means is bottomed out.

4,640,729
METHOD OF PRODUCING IONIZATION CHAMBER DETECTOR

Hideji Fujii, Nishitama; Takayuki Hayakawa, Hachioji; Shigeru Sato, Kitasoma, and Eiichi Yanagihara, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,108
Claims priority, application Japan, Jun. 4, 1984, 59-114029
Int. Cl.[4] H01J 1/88, 47/02
U.S. Cl. 156—257 14 Claims



1. A method of manufacturing an ionization chamber detector of the type in which a plurality of flat anode and cathode electrodes are alternately arranged in a predetermined gaseous medium, comprising the steps of:

forming a plurality of ditches of predetermined depth on respective surfaces of a pair of insulators;

disposing said insulators in spaced-apart relation, whereby opposing edges of said anode and cathode electrodes can be supported and fixed in said ditches;

applying a first adhesive having a B stage to portions of at least one surface of said anode and cathode electrodes, said portions being spaced a predetermined distance from the opposing edges of said anode and cathode electrodes which are to be supported and fixed in said ditches;

inserting the opposing edges of said anode and cathode electrodes, having said B stage adhesive thereon, respectively into said ditches on said respective surfaces of said pair of insulators such that there is a gap between said anode and cathode electrodes and the walls of said ditches;

charging a second curable adhesive having a low viscosity into the gaps between said anode and cathode electrodes and walls of said ditches; and

curing integrally said first adhesive having a B stage and said second adhesive in order to bond and fix said anode and cathode electrodes in said ditches.

11. The method of producing an ionization chamber detector as defined in claim 1, wherein said insulators are made of a transparent material and said second adhesive is a resin, curable by UV, the liquid adhesive having a low viscosity.

4,640,730
METHOD OF ADHERING ROOFING MATERIALS

Roger L. Streets; Thomas G. Rabito, and David N. Peresie, all of Ashland, Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

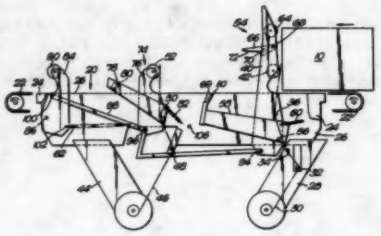
Filed Mar. 22, 1985, Ser. No. 715,138
Int. Cl.[4] C09J 5/02
U.S. Cl. 156—334 7 Claims

1. A process of adhering roofing materials consisting essentially of the steps of (a) coating edges of EPDM roofing materials with an adhesive composition consisting essentially of an admixture of 100 parts by weight of a thermoplastic block copolymer, from 10 to 150 parts by weight of an aromatic hydrocarbon resin, and solvent, (b) allowing said coated edges to dry, (c) joining said dried coated edges, and (d) heating said joined edges to a temperature greater than 300° F. and less than 500° F.

4,640,731
APPARATUS FOR TAPING CARTONS

Joseph S. Lerner, and David Krukas, both of Kings Park, N.Y., assignors to The Loveshaw Corporation, Deer Park, N.Y.

Filed Apr. 30, 1985, Ser. No. 728,728
Int. Cl.[4] B31B 1/72
U.S. Cl. 156—355 15 Claims



1. Apparatus for applying sealing tape to front and rear ends of a forwardly traveling rectangular carton and in two respective courses the first of which runs in part on the carton front vertical panel and around in part onto a carton horizontal panel and the second of which runs in part on said horizontal panel and around in part onto the carton rear vertical panel, said apparatus comprising

a first movably mounted tape applicator normally biased into projecting position in the path of carton forward travel to present tape from a first stock thereof in confrontation to the carton front panel, said tape applicator including an arm having a first pressing member thereon for pressing tape against the carton front panel, the advancing carton countering a bias on said tape applicator and retracting same as it advances and causing the tape to be wiped against said front panel,

first movably mounted cutter means including bias means tending to move said cutter means in a tape cutting direction, said tape applicator arm carrying a push finger which engages during at least a portion of the retraction movement of said applicator arm with said first cutter means for moving same in a direction opposite to said cutting direction,

cam means disposed for engagement thereof by said push finger during the terminal portion of applicator arm retraction for causing release of said push finger from engagement with said first cutter means whereby said cutter means moves in cutting direction to sever a length of tape from said first tape stock,

an additional pressing member carried on said tape applicator arm and disposed when said arm is retracted, in tape wiping relationship to the carton horizontal panel to press tape thereagainst,

a second movably mounted tape applicator disposed downstream of the first and normally biased into projecting position in the path of carton forward travel but connected to said first tape applicator to retract in tandem therewith, said second tape applicator when retracted presenting tape from a second stock thereof in alongside spaced confrontation to said horizontal panel, said second tape applicator including an associated movably mounted second cutter means normally biased to extend into the carton travel path in a tape cutting direction but being held retracted in opposition to said bias as the carton travels holdingly against said associated second cutter means,

forward travel of the carton beyond the retracted first tape applicator releasing said first tape applicator from retracted constraint so same is caused to tend to return to projecting position, return movement of the unconstrained first tape applicator being accompanied by said

second tape applicator tending to move to projecting position and thereby pressing the tape from said second stock against said horizontal panel, passage of the forwardly traveling carton beyond said second cutter means releasing same whereby the bias acting thereon moves it in a cutting direction to sever a length of tape from said second tape stock, and

a tape wiping member downstream of said second tape applicator and tandemly operable therewith to project extendingly from a retracted position thereof to wipe the length of severed tape from the second tape stock against the carton rear vertical panel.

4,640,732

APPARATUS FOR FUSION JOINING OF THERMOPLASTIC PIPES

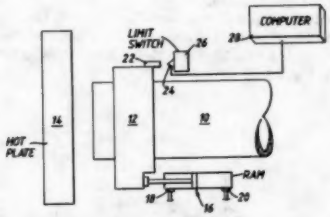
Trevor G. Stafford, Whitley Bay, England, assignor to British Gas Corporation, London, England

Filed Mar. 10, 1986, Ser. No. 837,755

Claims priority, application United Kingdom, Mar. 25, 1985, 8507711

Int. Cl.⁴ B65H *69/06*

U.S. Cl. 156—358 **6 Claims**



1. Apparatus for joining thermoplastic pipes by fusion comprising two clamps mounted on a guide structure, hydraulic ram means operable to force one clamp towards the other along the guide structure, a device arranged to detect movement of one clamp towards the other clamp, a microprocessor-based control system, a source of pressurised hydraulic fluid including a pump, a hydraulic control valve which has a control solenoid and which is operable in response to control of solenoid current by said system to increase the ram means fluid pressure at a pre-programmed relatively lower first rate until said device detects said movement, whereupon said system changes said solenoid current by a pre-programmed amount so that said pressure is further increased at a relatively higher second rate and the ram means completes its advance to effect bead-up.

4,640,733

APPARATUS FOR FORMING AND INSERTING AN INTERNAL LID IN A CONTAINER

Ingemar S. B. Bogren, 193 00, Sigtuna, Sweden

PCT No. PCT/SE84/00180, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04507, PCT Pub. Date Nov. 22, 1984

PCT Filed May 15, 1984, Ser. No. 694,400

Claims priority, application Sweden, May 19, 1983, 8302841

Int. Cl.⁴ B31F *7/00*

U.S. Cl. 156—380.2 **5 Claims**

1. Apparatus whereby an internal closure having a flat lid portion surrounded by an upwardly projecting rim portion is inserted into an upper end portion of a tubular container sleeve and whereby said rim portion is sealed to the sleeve by welding, said apparatus being of the type comprising a carrier in which a container sleeve is receivable for immobilized support, a welding ring in said carrier for surrounding said upper end portion of a sleeve therein and heating the same, and a piston means movable up and down relative to the carrier between a raised position above a sleeve in the carrier and a defined lowered position wherein the piston means is received in the carrier and at which a closure carried by the piston means has its rim portion radially opposite said welding ring, said piston means comprising coaxial upper and lower piston parts which are axially movable relative to one another and a resilient ring confined between said piston parts to be radially outwardly expanded by relative motion of said piston parts towards one another, for cooperation with the carrier in clamping the rim portion and the sleeve in tight engagement with one another, said apparatus being characterized by:

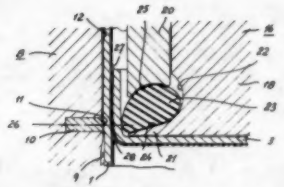
A. said resilient ring being toroidal;

B. said lower piston part having

(1) a flat bottom surface for closely overlying the lid portion of a closure,

(2) a circumferential groove which is spaced above said bottom surface and in which said resilient ring is closely received when unexpanded, and

(3) an annular upper surface which is inclined downwardly and radially outwardly, into which said groove merges downwardly and which cooperates with said bottom surface to define a thin edge around the bottom of the lower piston part;



C. said upper piston part having an annular lower portion with cylindrical and concentric radially inner and outer surfaces that concentrically surrounds said lower piston part above said annular upper surface thereon, said upper piston part further having an annular bottom surface with a radially inner edge and a radially outer edge at its respective junctions with said radially inner and outer surfaces

(1) which annular bottom surface opposes said upper surface on the lower piston part,

(2) which annular bottom surface has an arcuate cross-section profile between said inner and outer edges that substantially mates with the upper portion of the resilient ring when the same is unexpanded, and

(3) which annular bottom surface has said radially outer edge at a level substantially below the level of said radially inner edge so that upon downward motion of the upper piston part relative to the lower piston part said annular bottom surface cooperates with said annular upper surface to so expand the resilient ring radially outwardly that the maximum girth thereof is in a plane which is parallel and near to said flat bottom surface and which passes through said welding ring all around the same.

4,640,734

METHOD AND APPARATUS FOR ASSEMBLING LARGE PANELS

Ernest E. Roberts, DeSoto, Tex.; Paul H. Hansel, Thousand Oaks, and William O. Hudgens, Camarillo, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 24, 1984, Ser. No. 613,853

Int. Cl.⁴ B30B *5/00, 9/00*

U.S. Cl. 156—562 **9 Claims**

1. A system for assembling panels from a plurality of preformed sections, said system comprising:

a carousel structural pivotably mounted in the floor of an assembly area;

a plurality of press tables attached to said carousel structure and adapted to be rotated thereby, each of said press tables comprising;

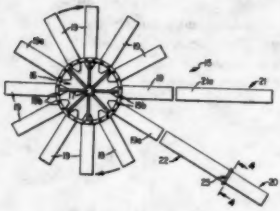
a frame;

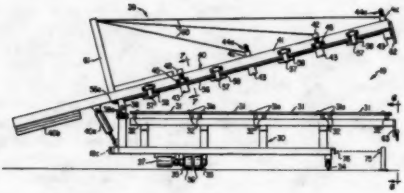
one or more plates mounted on said frame, and said plates forming a surface adapted to receive the number of said preformed sections necessary to form said panels in an aligned relationship;

means for applying adhesive to said preformed sections;

wheel means on said frame positioned between said frame and the floor of said assembly area;

a press rack pivotably mounted on said frame and adapted to move between an up position away from said surface and





a down position where said press rack is substantially parallel and adjacent said surface; said press rack comprising;

a frame support structure;

means on said frame support structure for releasably securing one or more support members to said frame support structure in a position where each of said support members will contact and rest on, and adhesively bond to all of said preformed sections on said surface when said press rack is in a down position; means for applying pressure to each of said support members downward toward said sections when said press rack is in a down position; and

means to rotate said carousel structure to thereby simultaneously move all of said plurality of press tables in a circular direction.

4,640,735

CYLINDER ASSEMBLY COVERING REMOVER

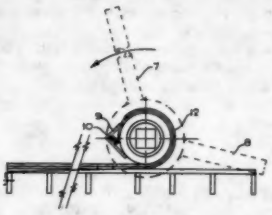
Leroy J. Murray, 15B Howd Ave., Stony Creek, Conn. 06405; Lawrence N. Olson, 23 Norwood Rd., New Haven, Conn. 06513; Robert Chavoya, 210 Okenuck Trail, Stratford, Conn. 06497, and James Wade, 100 Saw Mill Rd., Stony Creek, Conn. 06405

Filed Feb. 5, 1985, Ser. No. 698,379

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—584 **5 Claims**

1. A covering remover comprising a cylinder assembly which includes a cylinder and a rotatable shaft within the cylinder, connected means between the shaft and the cylinder, means to axially rotate said cylinder assembly, and strapping means attached to and extending tangentially from said cylin-



der assembly with said strapping means providing a lifting force underneath the covering to be removed when the cylinder assembly is rotated about its axis.

4,640,736

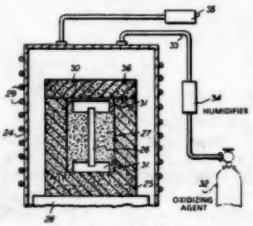
WAVE GUIDE FABRICATION METHOD

Robert L. Holman, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 193,248, Oct. 2, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,671

Int. Cl.[4] G02B *5/14*; B01B *9/00*; C03C *21/00*

U.S. Cl. 156—603 **4 Claims**



1. A method of forming a wave guiding layer in a transparent crystalline member comprising the steps of:

(a) placing said transparent crystalline member in a crucible having a cavity of dimensions such that said crystalline member is substantially symmetrically separated from the walls of said cavity in said crucible by a distance up to approximately 3 millimeters, said crucible comprising a material which gives off the same chemical component in the vapor phase as said transparent crystalline member at a predetermined temperature, said chemical component in the vapor phase having a vapor pressure less than about 10^{-4} atmosphere at said predetermined temperature;

(b) isothermally heating said transparent crystalline member and said crucible at said predetermined temperature in a chamber;

(c) providing a controllable atmosphere in said chamber which surrounds said transparent member and said crucible, said atmosphere having a more highly oxidizing atmosphere than one including only an oxygen (0_2) and moisture content by including ozone and/or single oxygen either alone or in combination with oxygen (0_2), water vapor, or oxygen (0_2) and water vapor together; and

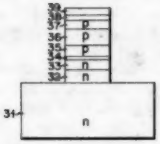
(d) maintaining said isothermal heating of the transparent crystalline member and crucible in said atmosphere at said predetermined temperature for a predetermined time and at a pressure of one atmosphere, so that a wave guiding layer is produced along the surface of said transparent crystalline member which has increased optical damage resistance.

4,640,737

DRY ETCHING METHOD OF COMPOUND SEMICONDUCTOR

Hiroko Nagasaka, Yokohama, and Nawoto Motegi, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1984, Ser. No. 664,965
Claims priority, application Japan, Nov. 30, 1983, 58-224077
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 13 Claims



1. A method for preparing a semiconductor light-emitting device including a semiconductor laser and a light-emitting diode, by reactive ion etching of a compound semiconductor comprising the steps of:

(a) introducing a plasma-generating gas comprising boron trichloride and chlorine into a plasma generation region which is defined between a cathode supporting a workpiece comprising a Group III–V compound semiconductor containing an element which may be readily oxidized and an anode opposite thereto;

(b) applying high-frequency electric power between said cathode and said anode, thereby generating a plasma from said plasma-generating gas; and

(c) etching said compound semiconductor with said plasma according to reactive ion etching, so as to prepare a light-emitting semiconductor device.

4,640,738

SEMICONDUCTOR CONTACT PROTECTION

Edward C. Fredericks, Haymarket, and Madan M. Nanda, Reston, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,656
Int. Cl.[4] H01L *21/312;* B44C *1/22*
U.S. Cl. 156—656 7 Claims

1. In a metal lift-off process for the deposition of a metal structure on a substrate, a method for protecting the sides of the metal structure from attack by chemicals used in subsequent processing steps, comprising the steps of:

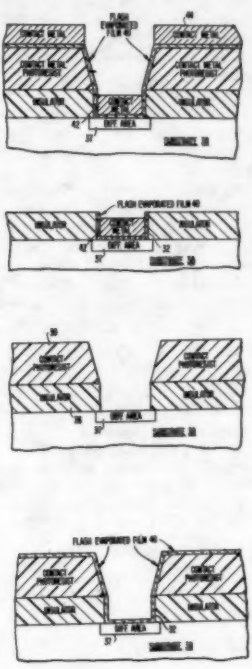
providing a substrate with an overlying insulating layer;

applying a layer of photoresist on the insulating layer;

forming a window with sidewalls through the photoresist and insulating layers down to the substrate surface;

flash evaporating a layer of protective semiconductor material which is resistant to attack by the chemicals used for photoresist removal on all surfaces of said sidewalls of said window;

depositing contact metal in said window and in contact with the substrate surface and with the sides of the metal structure conforming to the surface of said protective layer covering the sidewalls of said window; and



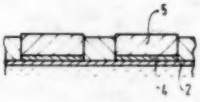
applying etching chemicals for photoresist removal and lift-off of undesired metal.

4,640,739

PROCESS OF PRODUCING GALVANIC LAYERS OF SOLDER OF PRECISE CONTOUR ON INORGANIC SUBSTRATES

Fedor Modic; Wolfgang Leibfried, both of Leonberg; Manfred Nitsch, Schwieberdingen; Kurt Spitzenberger, Weil der Stadt, and Herbert Zimmermann, Freiberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 765,815
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430001; Sep. 11, 1984, 3433251
Int. Cl.[4] C23F *1/02;* C25D *5/02;* B44C *1/22*
U.S. Cl. 156—659.1 15 Claims



1. Process for producing contoured solder layers overlying a copper layer on a surface of an inorganic substrate which is an electrical insulator composed predominantly of oxide material, comprising the steps of:

applying over an entire surface of said substrate, and then calcining, a conducting copper paste to form a conducting

and adhesion-promoting copper first layer (2) on said substrate;

superposing on said copper layer a photoresist film (3) and a negative image film of a desired pattern on top of said photoresist film, followed by exposing said photoresist film, through said negative image film, to illumination, developing said photoresist film and hardening the same in said desired pattern;

galvanically reinforcing the portion of said copper first layer not covered by said photoresist film with at least one layer (4) of a conducting layer composed of metallic material selected from the group which consists of copper and nickel;

galvanically depositing, on top of said at least one reinforcing layer, a layer (5) of lead-tin solder;

removing said hardened photoresist film;

etching away said copper first layer in the locations where said hardened photoresist film was removed, and

melting said solder layer for conforming its contour to the underlying unetched remainder of said copper first layer.

4,640,740

APPARATUS FOR EVAPORATIVE STRIPPING

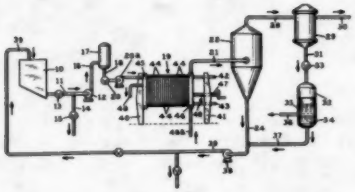
James G. Moore; James H. Obey, both of Williamsville, and Edward B. Pinkel, Angola, all of N.Y., assignors to Blaw Knox Corporation, Pittsburgh, Pa.

Division of Ser. No. 385,322, Jun. 4, 1982, Pat. No. 4,511,431. This application Nov. 2, 1984, Ser. No. 667,862

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.⁴ B01D *1/00*; F28F *3/08*

U.S. Cl. 159—13.1 **5 Claims**



1. An apparatus for removing volatile components from a heat sensitive liquid material having foaming characteristics, which comprises

(a) a liquid product heating means operable to heat said liquid product in the absence of a stripping gas to a predetermined temperature, whereby the liquid product remains at preselected pressure and temperature levels to prevent any vaporization of the volatile components from occurring during the heating of the liquid material,

(b) a volatile component evaporation section and

(c) a restrictive orifice forming flow path providing direct fluid communication between said liquid product heating means and said volatile component evaporation section and forming a partial restriction to fluid flow therebetween,

(d) said volatile component evaporation section and said restrictive orifice forming flow path being dimensioned relative to one another and in respect of the preselected pressure and temperature of the liquid product whereby the volatile components of the liquid material substantially instantaneously vaporize in a flashing action as the liquid material passes from the restrictive orifice forming flow path to the volatile component evaporization section,

(e) said volatile component evaporization section being further dimensioned to form a fluid flow conduit whereby the vaporized volatile components continue to flow as a high velocity vapor continuum carrying said liquid material in atomized droplet form and subjecting said liquid droplets to a turbulent stripping action to remove the remaining volatile components therefrom.

2. The apparatus according to claim 1, further characterized by

(a) a plate-type evaporator,

(b) said liquid product heating means comprising a first predetermined number of heated passes of said plate-type evaporator,

(c) said volatile component evaporation section comprising a second predetermined number of passes of said plate-type evaporator, and

(d) said restrictive orifice forming flow path comprising a third predetermined number of passes of said plate-type evaporator and being arranged between the first predetermined number of heated passes and the second predetermined number of passes,

(e) said third predetermined number of passes being fewer than each of said first and second predetermined number of passes of said plate-type evaporator.

4,640,741

FORMING FABRIC FOR USE IN A PAPERMAKING MACHINE

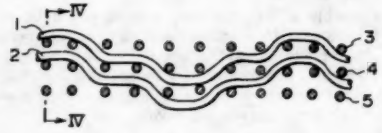
Ishino Tsuneo, Inagi, Japan, assignor to Nippon Filcon Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 653,435

Claims priority, application Japan, Nov. 30, 1983, 58-224412

Int. Cl.⁴ D03D *13/00*; D21F *1/00, 11/00*

U.S. Cl. 162—202 **17 Claims**



1. A forming fabric for use in a papermaking machine having two warp layers consisting of machine direction threads and three weft layers consisting of cross machine direction threads, comprising:

an uppermost weft layer adapted to define the Paper-web supporting surface of said fabric during use;

an intermediate weft layer arranged below said uppermost weft layer;

a lowermost weft layer arranged below said intermediate weft layer to define the under-side of said fabric during use;

an upper warp layer, the warp threads of which are interwoven only with said uppermost weft layer and with said intermediate weft layer; and

a lower warp layer, the warp threads of which are interwoven only with said intermediate weft layer and said lowermost weft layer, the warp threads of the lower warp layer passing between the uppermost weft layer and the intermediate weft layer, and then between the intermediate weft layer and the lowermost weft layer, and then beneath the lowermost weft layer, and then again between the intermediate weft layer and the lowermost weft layer, and then again appearing between the uppermost weft layer and the intermediate weft layer to complete one cycle of a weave pattern;

whereby when said forming fabric is stretched longitudinally, the under-side knuckles of said lower warp layer are positioned higher than the under-side knuckles of adjacent threads of said lowermost weft layer, such that the lowermost weft layer is subject to wear before the lower warp layer.

17. In a method for making paper wherein a paper-web is formed on a forming fabric in the wire part of a papermaking

machine, the improvement comprising using a forming fabric having two warp layers consisting of machine direction threads and three weft layers consisting of cross machine direction threads, comprising:

an uppermost weft layer adapted to define the paper-web supporting surface of said fabric during use;

an intermediate weft layer arranged below said uppermost weft layer;

a lowermost weft layer arranged below said intermediate weft layer to define the under-side of said fabric during use;

an upper warp layer, the warp threads of which are interwoven only with said uppermost weft layer and with said intermediate weft layer; and

a lower warp layer, the warp threads of which are interwoven only with said intermediate weft layer and said lowermost weft layer, the warp threads of the lower warp layer passing between the uppermost weft layer and the intermediate weft layer, and then between the intermediate weft layer and the lowermost weft layer, and then beneath the lowermost weft layer, and then again between the intermediate weft layer and the lowermost weft layer, and then again appearing between the uppermost weft layer and the intermediate weft layer to complete one cycle of a weave pattern;

whereby when said forming fabric is stretched longitudinally, the under-side knuckles of said lower warp layer are positioned higher than the under-side knuckles of adjacent threads of said lowermost weft layer, such that the lowermost weft layer is subject to wear before the lower warp layer.

4,640,742

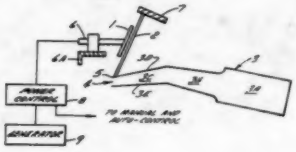
METHOD AND APPARATUS FOR CONTROLLING THE SIZE OF AN OPENING THROUGH WHICH A PRODUCT IS METERED

Donald E. Helleur, 221 Mortlake, St. Lambert, Quebec, Canada

Continuation of Ser. No. 459,327, Jan. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 306,465, Sep. 28, 1981, abandoned. This application Sep. 17, 1984, Ser. No. 650,783

Int. Cl.[4] B29C *39/38, 39/44;* **D21C** *1/02, 1/06*

U.S. Cl. 162—212 **15 Claims**



1. An apparatus for controlling the size of an opening through which material is metered, said opening being defined by at least first and second members spaced apart from each other, at least one of the members being movable toward or away from the other member to change the size of the opening, a heat expandable member associated with the movable member and a fixed base, magnetic field generating means for generating a magnetic field and including an induction coil spaced from said heat expandable member, said induction coil having a magnetic core which is operatively connected to said heat expandable member whereby magnetic flux generated by said magnetic field is conducted from the magnetic core to said heat expandable member to heat the same, the heat expandable member having higher resisitivity and permeability than said magnetic core, thereby causing said expandable member to expand and cause movement of the movable member, said magnetic field generating means being located in a position relative to the heat expandable member so that no external material will impede magnetic flux from the magnetic field inducing heat in said heat expandable member and so that the magnetic field generating means may generate a maximum amount of flux and a minimum amount of heat.

5. A method of use in controlling the size of an opening through which material is metered and wherein at least part of said opening is defined by a movable member with a heat expandable member associated with the movable member and a fixed base, the method comprising the steps of providing magnetic field generating means, positioning the magentic field generating means about a magnetic core, electrically connecting said magnetic core to said expandable member by a low resistance electrical conductor to close the magnetic circuit of said core with the heat expandable member, and selectively controlling the application of electrical power to the magnetic field generating means to cause the generation of magnentic field and thereby cause generation of heat in the heat expandable member to control the size of the opening.

4,640,743

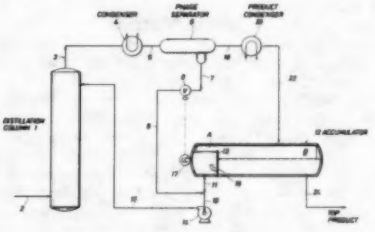
MULTI-STAGE CONDENSATION PROCESS

Robert P. Bannon, and Stanley Marple, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 24, 1985, Ser. No. 726,854

Int. Cl.[4] B01D *3/14*

U.S. Cl. 203—87 **4 Claims**



1. A two-stage condensation process comprising:

(a) distilling a multi-component liquid in a distillation column under conditions to provide an overhead fraction vapor;

(b) condensing a portion of the overhead fraction vapor in a first condensation zone to obtain a liquid in addition to the partially cooled vapor;

(c) passing said partially cooled vapor and liquid from the first condensation zone and separating said partially cooled vapor and said liquid in a separation zone;

(d) passing a first portion of said liquid from the separation zone to the upper portion of said distillation column to contact said overhead fraction;

(e) accumulating a second portion of said liquid from the separation zone in a first accumulation section of an accumulating zone, said accumulating zone also comprising a second accumulation section having vapor communication with the first accumulation section but being separated from said first accumulation section by a barrier which provides for one way flow of liquid from the second accumulation section to the first accumulation section in the lower portion of said barrier, the first acccumulation section and the second accumulation section being at different temperature;

(f) passing said partially cooled vapor from the separation zone to a second condensation zone at a lower temperature than the first condensation zone to form a condensed liquid and passing the condensed liquid to the second accumulation section of the accumulating zone, and;

(g) controlling the flow of liquid from said separation zone to said first accumulation section so as to minimize the

flow of liquid from said second accumulation section to said first accumulation section.

4,640,744

AMORPHOUS CARBON ELECTRODES AND THEIR USE IN ELECTROCHEMICAL CELLS

Arthur T. Howe, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 23, 1984, Ser. No. 573,112

Int. Cl.[4] C25B *1/00, 11/12, 9/00*; **H01M** *6/30*

U.S. Cl. 204—1 R **15 Claims**

11. A method for carrying out an electrochemical reaction which comprises effecting said electrochemical reaction at an electrode which comprises an electrically conducting substrate having a surface coating of amorphous carbon.

4,640,745

PROCESS FOR PRODUCING A CUTTING BASE

Herbert Knothe, Neumünster, and Klaus Röschmann, Schilp, both of Fed. Rep. of Germany, assignors to Teldec Schallplatten GmbH, Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP84/00365, § 371 Date Sep. 9, 1985, § 102(e) Date Sep. 9, 1985, PCT Pub. No. WO85/02420, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 22, 1984, Ser. No. 767,285

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342286

Int. Cl.[4] C25D *1/10*

U.S. Cl. 204—5 **15 Claims**

1. Process for producing a sound recording cutting base, comprising:

precipitating a cuttable copper layer on a substrate from an electroplating bath, the copper layer having an initial grain size and having recrystallizing characteristics as a result of the bath's composition, convection and current density, characterized in that in order to extend recrystallization time, substances are added to the bath which, by their incorporation in the copper layer, stabilize the latter in such a manner that recrystallization is prevented or delayed, said substances including leveling agents added in effective amounts to prevent formation of large-grain crystals of copper having a grain size which substantially exceeds the initial grain-size.

4,640,746

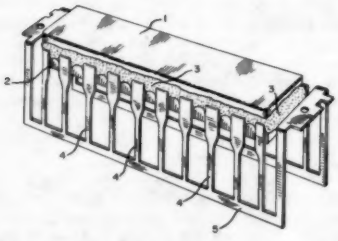
BATH AND PROCESS FOR PLATING TIN/LEAD ALLOYS ON COMPOSITE SUBSTRATES

Fred I. Nobel, Sands Point, and David N. Schram, Freeport, both of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 659,818, Oct. 11, 1984, which is a continuation-in-part of Ser. No. 423,748, Sep. 27, 1982, abandoned. This application Sep. 11, 1985, Ser. No. 774,822

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 **9 Claims**



1. A process for electroplating a composite substrate having an electroplatable portion and a non-electroplatable portion which comprises electroplating said composite substrate with a solution containing at least one soluble tin and at least one soluble lead compound in which the tin and lead are in the divalent state, and a complexing agent of a soluble salt of a gluconate, pyrophosphate, citrate, malate, tartrate or malonate, said solution having a pH of between about 1.5 and about 5.5, and containing less than about 30 g/l or about 5% of the overall solution of ammonia or ammonium compounds, to produce a desired tin/lead electrodeposit upon the electroplatable portion without adversely affecting or plating upon the non-electroplatable portion of the substrate.

4,640,747

PROCESS FOR SURFACE TREATMENT OF COPPER PRODUCT

Kuniki Ueno, and Naotomi Takahashi, both of Saitama, Japan, assignors to Mitsui Mining and Smelting Co., Ltd., Japan

Filed Oct. 23, 1985, Ser. No. 790,389

Claims priority, application Japan, Nov. 6, 1984, 59-233572

Int. Cl.[4] C25D *5/50*

U.S. Cl. 204—37.1 **7 Claims**

1. A process for surface-treating a copper product, which process comprises electrically depositing a binary alloy consisting of 95 to 20% by weight of zinc and 5 to 80% by weight of nickel, on the surface of a copper product to form a coating layer, followed by laminating or heat-pressing copper product thus obtained onto a base material so as to convert said binary alloy into a ternary alloy of zinc, nickel and copper.

4,640,748

POLYISOTHIANAPHTENE, A NEW CONDUCTING POLYMER

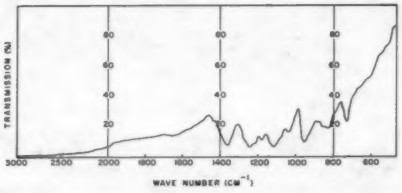
Fred Wudl, Santa Barbara; Masao Kobayashi, Goleta, and Alan Heeger, Santa Barbara, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 634,805, Jul. 26, 1984, abandoned. This application May 22, 1985, Ser. No. 736,984

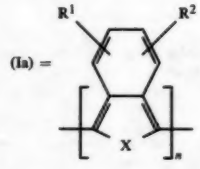
Claims priority, application Japan, May 31, 1984, 59-109329; Jun. 15, 1984, 59-121956

Int. Cl.[4] C25C *1/00*

U.S. Cl. 204—59 R **42 Claims**



1. A poly(isothianaphthene) polymer having a structural formula selected from the group consisting of (Ia) and (Ib) wherein:



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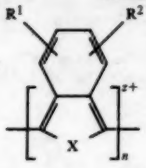


zY⁻

and wherein said R^1 and R^2 are selected independently from the group consisting of hydrogen atoms and hydrocarbon residues having 1 to 5 carbon atoms, with the proviso that said R^1 and R^2 may link together to form, along with the benzene ring, a fused ring which is naphthalene; said X is selected from the group consisting of sulfur, selenium and tellurium; said Y^- represents an anion of an electrolyte; said z represents a number from 0.01 to 1 showing a ratio of the anion per mol of a monomer; and said n represents a number of from 5 to 500 showing a degree of polymerization.

4,640,749

ELECTRICALLY CONDUCTIVE PYRROLE COPOLYMERS AND THEIR PREPARATION

Herbert Naarmann, Wattenheim; Gernot Köehler, and Johannes Schlag, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 504,723, Jun. 16, 1983, Pat. No. 4,532,188.
This application May 7, 1985, Ser. No. 731,458
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223545
Int. Cl.⁴ C25C *1/00*
U.S. Cl. 204—59 R **19 Claims**

1. An electrically conductive copolymer characterized by a capability for being converted from a p-conductive to an n-conductive system, and wherein said copolymer is obtained by the anodic oxidation of a pyrrole monomer and one or more comonomers selected from the group consisting of an alkyne and an aromatic, with the weight ratio of pyrrole units to comonomer units being in the range of from 20:80 to 90:10.

4,640,750

PROCESS FOR THE PREPARATION OF 3-HYDROXY-3-METHYLGLUTARIC ACID

Peter Blickle, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 801,761
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443303
Int. Cl.⁴ C25B *3/02*
U.S. Cl. 204—79 **3 Claims**

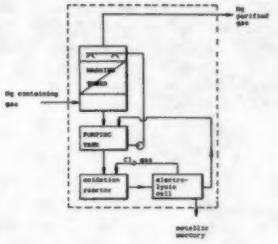
1. A process for the preparation of 3-hydroxy-3-methyl-glutaric acid by oxidation of 3-methyl-1,3,5-pentanetriol in aqueous alkaline solution, followed by acidification of the alkaline solution and conventional working up, which comprises carrying out the oxidation by electrolysis using anodes coated with nickel oxide/hydroxide NiO(OH).

4,640,751

METHOD FOR THE PURIFICATION OF GASES CONTAINING MERCURY AND SIMULTANEOUS RECOVERY OF THE MERCURY IN METALLIC FORM

Frøystein Dyvik, and Kjetil Børve, both of Odda, Norway, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Oct. 4, 1985, Ser. No. 784,464
Claims priority, application Norway, Oct. 19, 1984, 844201
Int. Cl.⁴ C25C *1/00*
U.S. Cl. 204—105 R **8 Claims**



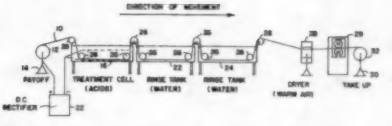
1. A method for the purification of gas containing mercury and the recovery of mercury in metallic form comprising:
(a) reacting metallic vaporous mercury in the gas with mercuric chloride compounds in a liquid phase whereby mercurous chloride is formed;
(b) oxidizing the mercurous chloride with chlorine in a liquid phase whereby a concentrated solution of mercuric chloride compounds is formed;
(c) subjecting the concentrated solution of mercuric chloride compounds to electrolysis whereby metallic mercury and chlorine is formed; and
(d) supplying said formed chlorine to step (b).

4,640,752

METHOD FOR PRODUCING SILVER COLORED BRAZING ALLOY

Arthur D. Taylor, Foxboro, and Thomas M. Upson, Norton, both of Mass., assignors to Engelhard Corporation, Menlo Park, N.J.

Filed Oct. 28, 1985, Ser. No. 791,980
Int. Cl.⁴ C25F *1/00*
U.S. Cl. 204—141.5 **1 Claim**



1. The process of imparting a uniform silver/gray surface appearance to silver copper alloy strip material comprising the steps of:
providing a supply roll of silver copper alloy strip material;
providing an acid treatment bath having a cathode disposed therein;
passing the strip material from the supply roll to the treatment bath; and
resistively heating the strip material to at least 350° C. prior to its entry into the treatment bath by passing an electric current through the strip material and the treatment bath to the cathode; and
electrolytically dissolving copper oxide from the surface of the strip material in the treatment bath.

4,640,753
METHOD OF ELECTROCOATING METALLIC SURFACES

Christopher P. Banks, Saffron Walden, and Edward Irving, Burwell, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 19, 1985, Ser. No. 746,429
Claims priority, application United Kingdom, Jun. 27, 1984, 8416389
Int. Cl.[4] C25D *13/06*; C09D *3/58*
U.S. Cl. 204—181.7 16 Claims

1. A method of coating a metallic surface which comprises passing an electric current at a voltage of at least 15 volts between the metallic surface as anode and a cathode in contact with a composition comprising

(A) an epoxide resin, and

(B) a salt of formula

$$[A^{y+}]\,[Z^-]_y \qquad I$$

where

A^{y+} denotes a cation which is a metal, a metal complex, an organometallic, a heterocycle, ammonium, a sulfoxonium, a substituted ammonium, or a phosphonium ion,

y denotes 1, 2, or 3,

Z^- denotes an anion selected from perchlorate, trifluoromethane sulfonate, pentafluorohydroxyoantimonate and complex anions of formula MQ_d^-,

M represents an atom of a metal or metalloid selected from boron, phosphorus, antimony and arsenic,

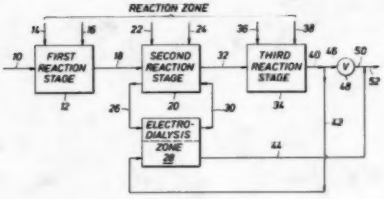
Q represents a halogen atom, and

d is 4 to 6 and is one more than the valency of M, whereby polymerized epoxide resin is deposited on the metallic surface.

4,640,754
PROCESS FOR THE PRODUCTION OF DICHLOROHYDRIN

F. Norman Grimsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 27, 1985, Ser. No. 814,346
Int. Cl.[4] C25B *3/06*; B01D *13/02*
U.S. Cl. 204—182.4 8 Claims

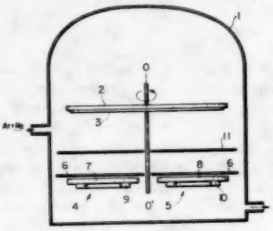


1. In a continuous process for the production of dichlorohydrin by the reaction of allyl chloride, water and chlorine in a reaction zone comprising a first reaction stage, a final reaction stage, and at least one intermediate reaction stage, where the reaction mixture from at least one reaction stage, before entering the next reaction stage is electrodialyzed in a separate electrodialysis zone having a feed inlet and a concentrate inlet, to remove ions formed during said reaction, the improvement which comprises passing at least a portion of the reaction product from said final reaction stage to the concentrate inlet of said at least one electrodialysis zone, and withdrawing an ion-containing reaction product concentrate stream from such said electrodialysis zone, whereby any dichlorohydrin which passes into the concentrate stream in said at least one electrodialysis zone may be recovered.

4,640,755
METHOD FOR PRODUCING MAGNETIC MEDIUM

Noboru Sato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,674
Claims priority, application Japan, Dec. 12, 1983, 58-234089; Feb. 10, 1984, 59-23883
Int. Cl.[4] C23C *14/36*
U.S. Cl. 204—192.2 7 Claims



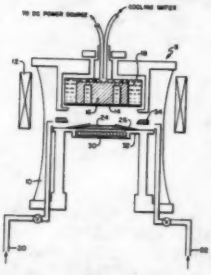
1. A method for producing a magnetic medium comprising the steps of:

sputtering a magnetic material consisting of Fe-Co alone or Tb-FeCo onto a substrate in an atmosphere of argon gas mixed with nitrogen gas in a sufficient amount to increase the saturation intensity of magnetization of said material and forming a magnetic film on said substrate while rotating said substrate.

4,640,756
METHOD OF MAKING A PIEZOELECTRIC SHEAR WAVE RESONATOR

Jin S. Wang, Harbor City, Calif.; Kenneth M. Lakin, and Allen R. Landin, both of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 545,411, Oct. 25, 1983, abandoned. This application May 20, 1985, Ser. No. 736,164
Int. Cl.[4] C23C *14/38*
U.S. Cl. 204—192.18 13 Claims



1. A method of depositing a film of piezoelectric material on a substrate, the film having a uniform, controlled, inclined C-axis orientation comprising:

providing a dc planar reactive sputtering system having a chamber containing a cathode for holding a target, an anode spaced from and parallel to the cathode for holding the substrate and a reactive gas,

establishing an electrical field between the cathode and the anode to sputter the target such that the target material ionizes to form an ion flux which reacts with the reactive

gas forming the piezoelectric material which deposits on the substrate,

providing a positively biased control electrode in the chamber near the substrate and establishing a second, dc electrical field between the control electrode and the anode to collect the electron current and control the ion flux, the electrode position and the strength of the dc field being sufficient to alter the direction of the ion flux as it strikes the substrate to control the orientation of the C-axis away from the direction of the control electrode, the distance of the electrode above the plane of the substrate and the strength of the second electrical field controlling the degree of inclination of the C-axis, thereby forming a film of piezoelectric material having a uniform, controlled, inclined C-axis.

4,640,757

VERTICAL CELLS FOR THE CONTINUOUS ELECTRODEPOSITION OF METALS AT HIGH CURRENT DENSITY

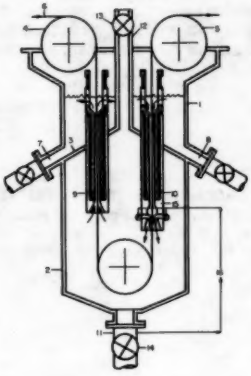
Maurizio Podrini, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A, Rome, Italy

Filed Jan. 28, 1986, Ser. No. 823,280

Claims priority, application Italy, Feb. 8, 1985, 47663 A/85

Int. Cl.⁴ C25D *17/00*

U.S. Cl. 204—206 **3 Claims**



1. In a plant for continuous high current density electrodeposition of metals on other metal bodies in movement, comprising at least one treatment unit having an upper chamber and a lower chamber containing electrolyte and connected by two vertical electroplating cells, wherein the metal body to be plated passes from said upper chamber downwards through the first of said cells to the lower chamber, where it is diverted and returns upwards through the second of said cells to the upper chamber, while the electrolyte is forced to pass in the opposite direction in each of the two cells, the improvement in which only one pumping device is used for each of the treatment units, said pumping device being located at one extremity of only one of the two cells and having its delivery directed into one of said chambers, said one chamber being completely filled with electrolyte which is in continuous communication with the outside of said one chamber only though the other chamber, via said vertical electroplating cells.

4,640,758

APPARATUS FOR THE ELECTRODEPOSITION OF A COATING ON AN ENDLESS BELT

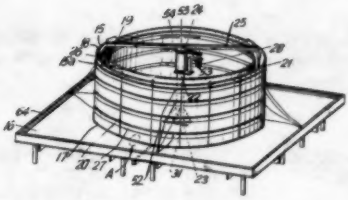
Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Mar. 6, 1986, Ser. No. 837,017

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509388

Int. Cl.⁴ C25D *17/00*

U.S. Cl. 204—272 **27 Claims**



1. Apparatus for the electrodeposition of a metal coating comprising an electrolytic bath including a generally horizontally arranged base plate, wall means secured to and extending upwardly from said base plate forming an annular bath having a generally circularly extending radially inner surface and a generally circularly extending radially outer surface spaced outwardly from the inner surface and said inner and outer surfaces being concentric about a common centerpoint located on said base plate, said annular bath arranged to contain an aqueous electrolytic solution extending between and contacting said inner and outer surfaces, said wall means comprising at least a first endless press belt for use in a double band press having a first face surface directed toward the common centerpoint and a second face surface forming said inner surface of said annular bath and a second endless press belt having a first face surface directed toward the common centerpoint and forming the outer surface of said annular bath and an oppositely directed second surface, a vertically extending mast extending vertically upwardly from the common centerpoint and being electrically insulated from said base plate, a pair of generally horizontally extending arms each having a first end and a second end with the first ends thereof secured to the top of said mast and said arms extending radially outwardly therefrom with the second ends located spaced radially outwardly from the inner surface, means for forming an anode located within said annular bath, a constant voltage source, means connecting said constant voltage source to said anode forming means and to a selected part of said wall means for forming a cathode so that an electrodeposition of a metal coating takes place from the electrolytic solution onto the selected part of said wall means.

4,640,759

SUPPORTED MEDIUM FOR ELECTROPHORESIS AND SUPPORTS THEREFOR

Masakazu Hashiue, Kaisei, and Masashi Ogawa, Asaka, both of Japan, assignors to Fuji Photo Film Co., Ltd.

Filed Mar. 11, 1985, Ser. No. 710,130

Claims priority, application Japan, Mar. 12, 1984, 59-47556; Apr. 20, 1984, 59-79612

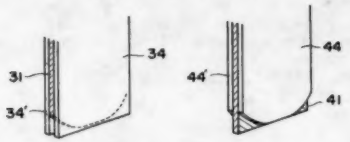
Int. Cl.⁴ G01N *27/28*

U.S. Cl. 204—299 R **8 Claims**

1. An electrophoresis apparatus including a medium for electrophoresis tightly sandwiched by supports, the improvement which comprises the length of both side portions of the medium along the direction of electrophoresis is shorter than that of the center portion of the medium.

5. An electrophoresis apparatus including a set of supports for tightly sandwiching a medium to be employed in a process

for electrophoresis wherein the potential in the direction of electrophoresis is larger at both side portions of the medium than at the center portion thereof, wherein the length of both



side portions of at least one support along the direction of electrophoresis is shorter than that of the center portion of the same support.

4,640,760

PROCESS FOR UPGRADING CARBONACEOUS MATERIAL COMPRISING LIQUID EXTRACTION AND FLASH PYROLYSIS OF EXTRACTION RESIDUE

William G. Billings, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 31, 1984, Ser. No. 646,341
Int. Cl.[4] C10G 1/04
U.S. Cl. 208—390 **12 Claims**

6. A process for recovering hydrocarbons from raw tar sands comprising:

(a) adding a solvent to the raw tar sands and mixing to form an oil and solvent-containing mixture of tar sands;

(b) separating the oil and solvent from said mixture leaving a residue of sands and heavy hydrocarbons;

(c) raising the temperature of said residue and maintaining the temperature in the range of 800° C. to about 1200° C. for a period of time in the range of 0.1 to about 10 seconds to produce a combustible synthesis gas and hot pyrolyzed tar sand;

(d) combusting the pyrolyzed tar sand with a free-oxygen containing gas to recover residual carbon values therefrom, producing hot combustion gases and hot carbon free sand;

(e) distilling the solvent as a solvent vapor from the oil and solvent-containing mixture;

(f) condensing a first portion of the solvent vapor in a condenser; and

(g) adsorbing a second portion of the solvent vapor in an adsorbent bed.

4,640,761

PROCESS FOR PREPARING PITCH

Makihiko Mori, Nara; Satoshi Kibe, Kashihara, and Toyohiro Maeda, Tenri, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

PCT No. PCT/JP83/00279, § 371 Date Apr. 17, 1984, § 102(e) Date Apr. 17, 1984, PCT Pub. No. WO84/00975, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 27, 1983, Ser. No. 606,778
Claims priority, application Japan, Aug. 30, 1982, 57-151621
Int. Cl.[4] C10C 1/20, 3/02
U.S. Cl. 208—44 **30 Claims**

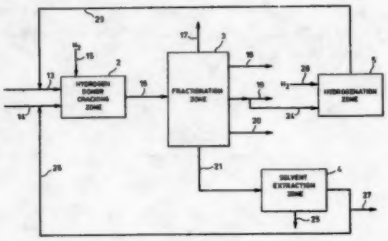
1. A process for preparing pitch comprising the steps of heat-treating coal tar or coal tar pitch at a temperature of 300° to 500° C. and a pressure ranging from ambient pressure to 20 kg/cm^2-G for 0.5 to 50 hours to cause the aggregation of quinoline insoluble components 0.3 μm or less in particle size into solids of increased apparent particle size and centrifuging the heat-treated material at a temperature of 100° to 450° C. and at a centrifugal force of 500 to 3,500 G to remove the aggreated solids of quinoline insoluble component and recovering said pitch.

4,640,762

PROCESS FOR IMPROVING THE YIELD OF DISTILLABLES IN HYDROGEN DONOR DILUENT CRACKING

H. John Woods, Campbellville, and Frank Souhrada, Islington, both of Canada, assignors to Gulf Canada Corporation, Calgary, Canada

Filed Jul. 8, 1985, Ser. No. 752,710
Int. Cl.[4] C10G 47/34, 65/12
U.S. Cl. 208—56 **9 Claims**



1. A process for converting a feedstock comprising a heavy, high-boiling hydrocarbon oil residuum and a recycle stock to produce lower-boiling hydrocarbons, comprising:

(a) thermally hydrocracking said feedstock with hydrogen donor diluent in a hydrogen donor diluent cracking zone to produce a hydrocracked product stream,

(b) fractionating said hydrocracked product stream into at least one distillate fraction and a hydrocracked residuum fraction,

(c) contacting said hydrocracked residuum fraction with an extracting solvent to produce (i) a deasphalted oil fraction containing deasphalted oil bottoms fraction having a boiling point of at least 500° C. and (ii) as asphaltenes-rich residue, and

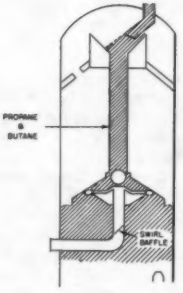
(d) directly recycling at least the deasphalted oil bottoms fraction of said deasphalted oil fraction as said recycle stock.

4,640,763

INJECTION OF LPG INTO TCC UNIT

Tai-Sheng Chou, Sewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,196
Int. Cl.[4] C10G 57/02; C07C 2/12, 2/58
U.S. Cl. 208—78 **20 Claims**



1. A process for catalytically cracking hydrocarbon feed in a bed of catalyst effective to crack said hydrocarbon feed, comprising

contacting said feed under catalytic cracking conditions,

with said catalyst in a first portion of said bed, to produce cracked product; sealing another portion of that bed of catalyst by introducing into said another portion of that bed a seal selected from the group consisting of ethane, propane, butane, isobutane, ethylene, propylene, butylene, isobutylene and mixtures thereof whereby feed and cracked product are prevented from surging into said another portion;

whereby contact of the seal with catalyst in said another portion of the bed results in conversion of the seal to the higher molecular weight adducts thereof, the condition in said another portion of the bed being effective to provide said conversion.

4,640,764

SELECTIVE TRICYCLIC HYDROGENATION AND CRACKING PROCESS AND CATALYST SUITABLE FOR SUCH HYDROCONVERSION

David M. Hamilton, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 24, 1986, Ser. No. 831,884
Int. Cl.[4] C10G *47/04*
U.S. Cl. 208—110 25 Claims

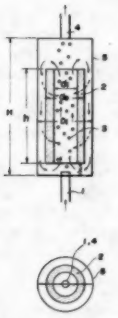
1. A selective hydrocracking and hydrogenation process to upgrade the cetane value of a hydrocarbon distillate boiling in the range of from 300° to 700° F. and containing C_{10} to C_{18} normal paraffins, C_{10} to C_{18} isoparaffins, tetralins, decalins and undesirable tricyclic hydrocarbons which process comprises contacting said hydrocarbon distillate with a catalytic metal or metals containing intercalated clay at hydrocracking and hydrogenation conversion conditions to selectively crack said tricyclic hydrocarbons in preference to said C_{10} to C_{18} normal paraffins, C_{10}–C_{18} isoparaffins, tetralins and decalins and to produce a hydrocarbon distillate having an increased cetane value.

4,640,765

METHOD FOR CRACKING HEAVY HYDROCARBON OILS

Junichi Kubo, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,734
Claims priority, application Japan, Sep. 4, 1984, 59-183673; Apr. 11, 1985, 60-75364
Int. Cl.[4] C10G *47/32, 47/34*
U.S. Cl. 208—110 17 Claims



1. A method for cracking a heavy oil containing heavy metals and at least 1% by weight of asphaltene comprising the steps of:

(a) vertically dividing the interior of a cracking tower into at least two portions with a porous partition housing a solid catalyst having a hydrogenation function;

(b) communicating said divided portions with each other at the upper and lower parts thereof;

(c) introducing a heavy fraction oil, a hydrogen donor solvent and a hydrogen-containing gas into said cracking tower at the lower part of at least one of said divided portions and letting said heavy fraction oil, said hydrogen donor solvent and said hydrogen containing gas ascend through said at least one portion, removing the hydrogen containing gas from the top of said cracking tower, whereby a pressure difference exists between the outside of said partition and the interior thereof;

(d) circulating a fluid including said heavy oil, hydrogen donor solvent between said at least one portion and the other divided portion and only part of said fluid goes through from the outside of said partition to the interior of said partition.

4,640,766

PROCESS FOR THE PREPARATION OF HYDROCARBONS

Martin F. M. Post, Houston, Tex.; Swan T. Sie, and Ernst J. R. Sudhölter, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1985, Ser. No. 725,189
Claims priority, application Netherlands, Apr. 25, 1984, 8401332
Int. Cl.[4] C10G *47/00*
U.S. Cl. 208—111 24 Claims

1. A process for the preparation of C_5+ hydrocarbons suitable for the production of middle distillates from C_4- hydrocarbons comprising:

(a) reforming C_4- hydrocarbons at a pressure higher than 10 bar in the presence of carbon dioxide and steam into a mixture of carbon monoxide and hydrogen having a H_2/CO molar ratio between 0.25 and 2.25 by using a carbon dioxide/hydrocarbon ratio (a) higher than 0.1, but lower than 10 g mol CO_2/g atom C, a steam/hydrocarbon ratio (b) higher than 0.1, but lower than 1 g mol H_2O/g atoms C and a carbon dioxide/steam ratio chosen such that $(2\times a+3\times b)>3$, and

(b) converting the product of (a) into a mixture of hydrocarbons substantially consisting of C_5+ hydrocarbons by contacting it at a temperature of 105°–305° C. and a pressure, substantially corresponding with that used in the reforming, with a cobalt catalyst comprising 3–60 pbw of cobalt and 0.1–100 pbw of at least one other metal chosen from the group formed by zirconium, titanium, and chromium per 100 pbw silica, alumina or silica-alumina, wherein said catalyst has been prepared by kneading and/or impregnation, and that when the H_2/CO mixture has a H_2/CO molar ratio lower than 1.5, the cobalt catalyst is used in a catalyst mixture with a copper and zinc containing composition having CO-shift activity.

4,640,767

HYDROCARBON EXTRACTION AGENTS AND MICROBIOLOGICAL PROCESSES FOR THEIR PRODUCTION

James E. Zajic, London, and Donald F. Gerson, Granton, both of Canada, assignors to Canadian Patents & Development Ltd/Societe Canadienne des Brevets et d'Exploitation Ltd., Ontario, Canada

Continuation of Ser. No. 106,848, Dec. 26, 1979, abandoned, which is a continuation of Ser. No. 872,010, Jan. 24, 1978, abandoned. This application Nov. 29, 1984, Ser. No. 675,470
Int. Cl.[4] C10G *32/00;* C12N *1/20;* C12P *21/00*
U.S. Cl. 208—390 8 Claims

1. A process for producing extraction agents useful in the separation of hydrocarbon values from mineral deposits, which comprises cultivating by an aerobic fermentation, in a growth promoting medium and under growth promoting conditions, and on a liquid hydrocarbon substrate, a selected mi-

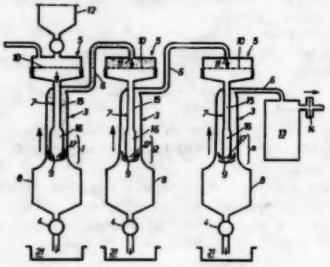
crobial strain of a species of microorganism selected from the group consisting of *Arthrobacter terregens, Arthrobacter xerosis, Bacillus megaterium, Corynebacterium lepus, Corynebacterium xerosis, Nocardia petroleophila,* and *Vibrio ficheri;* to produce an extraction agent of microbiological origin in said fermentation medium, subsequently recovering the extraction agent from the fermentation medium and drying said agent to powdered form.

4,640,768

ELUTRIATION APPARATUS FOR THE PURIFICATION AND SEPARATION OF POWDERS OF DIFFERENT DENSITIES

René J. Morbioli, and Jean C. Ney, both of Corbeil, France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation - S.N.E.C.M.A., Paris, France

Filed Jun. 15, 1984, Ser. No. 620,957
Claims priority, application France, Jun. 29, 1983, 83 10717
Int. Cl.[4] B07B *9/02*
U.S. Cl. 209—37 **2 Claims**



1. An elutriation apparatus for purification and separation of powders comprising:

at least first and second separating columns connected in series wherein each column further comprises an upper zone, a lower zone, a cross-sectional area of the lower zone being less than that of the upper zone in each of said columns, the ratio of cross-sectional areas in the respective upper and lower zones of the successive columns being substantially constant, and a cross-sectional area of the lower zone of column (n+1) of the series being such that the flow velocity therein is substantially equal to the flow velocity in the upper zone of the column n of the series which lies immediately upstream,

means for the introduction of a powder containing at least two fractions of a first lower Jensity and a second higher density to each of said first and second columns to be separated and for the introduction of a carrier fluid wherein said means for the introduction of powder further comprises a distributor tube arranged to discharge the carrier fluid and the powder carried thereby into the lower zone and through an opening formed at the lower end of the tube,

a deflector plate disposed transversely of the opening at the lower end of the tube wherein the deflector plate deflects the carrier fluid and powder into said lower zone,

means defining an outlet in the upper zone of said first column for the carrier fluid and powder

means positioned at the lower end of the columns for collecting a fraction of powder of coarser granulometry of the second higher density powder fraction,

means for removing the coarser grains from the means for collecting a fraction of the powder of coarser granulometry;

means for interconnecting said means defining the outlet in the upper zone of the first column and the means for introduction of the powder and the carrier fluid to the lower zone of said second column; and

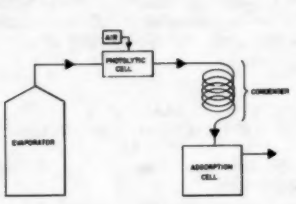
a screen disposed between said columns and in said means for interconnecting the first and second columns, the mesh of said screen being such that said screen retains the first lower density fraction of particles of a minimum diameter substantially equal to the minimum diameter of the second higher density fraction of particles retained in the collecting means at the lower end of the immediately preceeding column wherein the first and second powder fractions are successively separated in the interconnected elutriating columns and screens such that the second high density fraction is deposited in successive sized fractions in each of the collecting means of said columns and the first low density fraction is retained on said screens located in the columns interconnecting means as successive sized fractions.

4,640,769

APPARATUS FOR PHOTOGRAPHIC FILM PROCESSOR POLLUTION CONTROL

Mark F. Wemhoff, P.O. Box 4031, Enterprise, Fla. 32725

Filed Aug. 29, 1985, Ser. No. 770,609
Int. Cl.[4] B01D *1/02, 5/00;* C02F *1/04, 1/32*
U.S. Cl. 210—96.1 **7 Claims**



1. A system for the removal of metals and reduction of biological and chemical oxygen demand (BOD/COD) in washless photographic processing chemistry comprising:

an evaporator including means for receiving effluent from said photographic processing, the effluent having metals dissolved therein and containing certain volatile organic compounds and other substances characterized by BOD/-COD; said evaporator including a corrosion-resistant vessel and having a temperature-resistant removable liner affixed to the interior of said vessel for collecting solids, a heat source for separation of vaporized water and volatile organic compounds from solids and complexed ionic metals;

a photolytic cell and ozone generator fluidly coupled to said evaporator for receiving, oxidizing, and photolyzing the vaporized water and volatile organic compounds;

a condenser fluidly coupled to said photolytic cell and ozone generator for receiving and condensing said photolyzed vapor into a condensate;

an activated carbon adsorption cell fluidly coupled to said condenser for receiving and purifying said condensate, said adsorption cell comprising an activated carbon media and outlet means;

an insulated enclosure for said system for conserving evaporative heat and dissipating condenser heat; and

control means coupled to said evaporator, photolytic cell and ozone generator, condenser, and activated carbon adsorption cell for controlling the operation of the system.

4,640,770

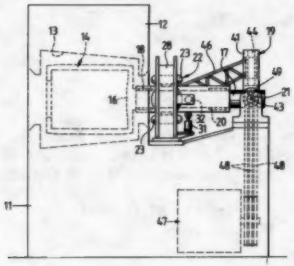
APPARATUS FOR EXTRACTING WATER FROM SOLID FINES OR THE LIKE

Lloyd B. Smith, Bristol, Tenn., assignor to United Coal Company, Bristol, Va.

Continuation-in-part of Ser. No. 719,534, Apr. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 436,735, Oct. 26, 1982, abandoned. This application Feb. 19, 1986, Ser. No. 831,055

Int. Cl.[4] B04B *1/06*

U.S. Cl. 210—144 30 Claims



1. In a centrifuge including an evelope for collecting fluid extracted thereby, means for introducing wet particulate solids into said centrifuge and means for removing dried solids from said centrifuge, the improvement comprising:

(a) a bowl mounted for rotation within said envelope and having an unobstructed opening at one end thereof for receiving said wet particulate solids, a base support closing the other end of said bowl and a plurality of outlet ports for discharging fluid into said envelope;

(b) a filter media liner proximal the inner surface of said bowl;

(c) means between said filter media liner and said bowl for allowing extracted fluid to move outwardly of said filter media liner;

(d) a continuous shaft fixed to said base support at one end and rotatably mounted at a second end on a gimbal-like system to maintain a vertex of precession of said shaft and bowl at said second end in a substantially well defined locus;

(e) variable speed drive means connected to said shaft adjacent said vertex to effectively rotate said bowl for centrifugally extracting fluids from said wet particulate solids; and

(f) resilient means supporting said shaft and bowl on bearings, located intermediate said vertex and said base support, with said resilient means for supporting said shaft being variable in resiliency and constructed to vary the natural radial frequency of said bowl and shaft in accordance with the speed of said drive means.

4,640,771

FLUID INTAKE SCREENING DEVICE

Charles E. Whalen, East Peoria, and Wilbur G. Hoover, Delavan, both of Ill., assignors to Caterpillar, Inc., Peoria, Ill.

Filed Nov. 4, 1982, Ser. No. 439,167

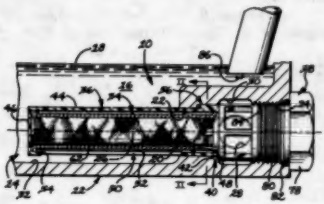
Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—167 11 Claims

8. A fluid intake screening device (10) adapted for insertion into a case (12) defining a sump (14), an opening (20) therethrough having inner and outer ends (22,24), and an outwardly facing shoulder (48) therebetween, comprising:

a tubular filter assembly (34) including a filter element (62) and a skeleton frame (64) of a construction sufficient for protectively supporting the filter element (62) concentrically therewithin;

a tubular baffle member (36) supporting the skeleton frame (64) concentrically therewithin and being extendable from the inner end (22) of the opening (20) into the sump (14) and defining an opening (54) therethrough; and



releasable closure means (38) for blocking the outer end (24) of the opening (20) and resiliently urging the skeleton frame (64) against the baffle member (36) and the baffle member (36) into seated engagement against the shoulder (48).

4,640,772

OIL CLEANING ASSEMBLIES FOR ENGINES

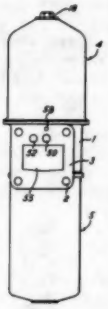
Neil A. Graham, Somerset, England, assignor to AE PLC, Warwickshire, England

Filed May 6, 1985, Ser. No. 731,168

Claims priority, application United Kingdom, May 4, 1984, 8411502

Int. Cl.[4] B01D *27/06, 45/12*

U.S. Cl. 210—295 8 Claims



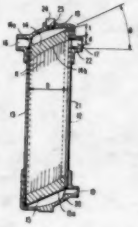
1. An oil cleaning assembly for an internal combustion engine, comprising means for enabling oil to flow through both a separator unit and a filter unit at all times when oil flows through a passage, including, a by-pass flow substantially vertically disposed centrifugal separator unit having an outer casing and an oil nozzle-driven rotor rotatable therein, the rotor being non-openable and disposable, a full flow filter unit having an outer casing and a filter element therein, at least the filter elememt being disposable, and a mounting member for mounting said casings by means of screw thread connections in such a way that the separator casing is upstanding from the mounting member, means for enabling both of said casings to be independently removable from said mounting member, the mounting member having first passage means for supplying high pressure oil from the engine pump directly to an inlet of each said separator unit and said filter unit, second passage means for receiving oil from said centrifugal separator unit and returning it to the engine sump and third passage means for receiving oil from said filter unit and supplying it to a pressurised engine lubricating system.

4,640,773

MEMBRANE SEPARATION APPARATUS

Yuji Nishida; Yoshiyasu Kamiyama, and Koichi Okuno, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed May 20, 1985, Ser. No. 735,897
Claims priority, application Japan, May 18, 1984, 59-101495
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.1 4 Claims



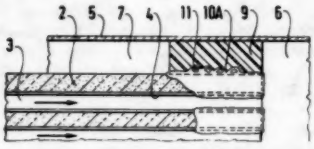
1. A membrane separation apparatus comprising: a cylindrical case provided with an outlet for a membrane permeated fluid; a plurality of tubular or capillary membranes which are inserted into the cylindrical case in a substantially parallel state with each other and in a closely bundled state, the membranes themselves and also the bundled membranes and the cylindrical case being bonded and fixed with casting resin at both end portions of said membranes and said cylindrical case to define two casting resin outer faces including open ends of said membranes; a cap having a nozzle for a feed inlet communicating directly with a first of said outer faces and a nozzle for a membrane permeated fluid outlet communicating with the interior of said cylindrical case between said casting resins and aligned with said outlet for a membrane permeated fluid provided in said cylindrical case, provided at one end of the cylindrical case; and a cap having a nozzle for a concentrated fluid communicating directly with a second of said outer faces, provided at another end of the cylindrical case, wherein at least one outer face is arranged with a slope with respect to a vertical axis of the cylindrical case, and the nozzle for the feed inlet and the nozzle for the membrane permeated fluid are provided on substantially the same axis which is perpendicular to the vertical axis of the cylindrical case.

4,640,774

ASSEMBLY OF MOUNTED TUBULAR FILTER MEMBERS INSIDE AN ENVELOPE

Daniel Garcera, Tarbes, and Jacques Gillot, Odos, both of France, assignors to Ceraver, S.A., Paris, France

Filed Jun. 19, 1985, Ser. No. 748,581
Claims priority, application France, Jun. 20, 1984, 84 09687
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—323.2 10 Claims



1. An assembly of at least one elongated tubular filter member having an outside surface, two ends, and at least one channel extending from end to end therethrough; an elongated envelope surrounding said member, the envelope having an inside surface spaced from the outside surface of the filter member; and a gasket of elastomeric or polymeric material disposed at at least one of the ends of the filter member between the outside surface of the tubular filter member and the inside surface of the envelope, the gasket contacting the filter member and the envelope over a portion of their respective lengths, wherein the improvement comprises:

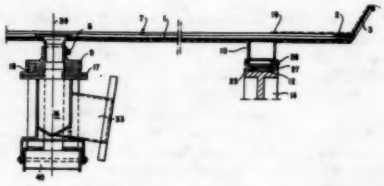
the outside surface of the filter member is provided, over at least a part of that portion of its length which contacts the gasket, with roughnesses, projections, or hollows of suitable size and in sufficient number to prevent the filter from sliding relative to the gasket due to differential thermal expansion of the filter member and the envelope.

4,640,775

VACUUM FILTER FOR THE SEPARATION OF SOLIDS FROM LIQUIDS

Kurt E. Pietzsch, Wiesbaden-Sonnenberg, Fed. Rep. of Germany, and Laszlo Bonnyay, JV-Wassennar, Netherlands, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Dec. 31, 1984, Ser. No. 687,805
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404110
Int. Cl.[4] B01D *33/32*
U.S. Cl. 210—387 8 Claims



1. A vacuum tray filter for separating solids from a liquid slurry comprising, an endless conveyor belt rotatble about a pair of longitudinally spaced wheels mounted on a main frame structure, said conveyor belt movable in a horizontal plane of travel located between said spaced wheels and defined by the distance therebetween, an endless row of U-shaped trays fixed to said conveyor belt for movement in said defined horizontal plane of travel, slurry feed means located at the tray entry to said horizontal plane, a filtration zone in said horizontal plane of travel arranged after said feed means, a stationary vacuum channel in said filtration zone, each of said U-shaped trays having a bottom wall and spaced sidewalls extending upwardly and away from said conveyor belt, each tray having a sealing engagement at the front and rear edges of said sidewalls and bottom walls thereof with the correpsonding edges of the sidewalls and bottom walls of the next adjacent trays throughout movement of said engaged trays through said defined horizontal plane, an endless filter cloth lying between the said sidewalls of said engaged trays and disposed about the said engaged bottom walls of said trays along the entire length of said horizontal plane of travel, and said trays connected to said conveyor belt for gliding movement over said vacuum channel.

4,640,776

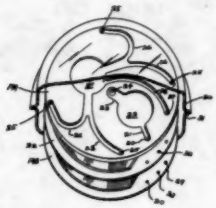
PLASMAPHERESIS FILTRATION MODULE HAVING PRESSURE BALANCING AND SEALING MEANS

Robert P. Luoma, II, Newark, Del., and Frank M. Willis, Wenonah, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 16, 1982, Ser. No. 349,368
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—433.2 5 Claims

1. Improved plasmapheresis filtration module having a planar membrane between a blood side support and a plasma side

support, the blood side support having a plurality of blood flow paths extending radially from a central inlet to a plasma-depleted blood channel, wherein the improvement comprises means for blood pressure balancing and membrane sealing at the ends of the blood flow paths on the blood side support, said



module further having radial blood flow channels as the blood flow paths on the blood side support and wherein the balancing and sealing means is comprised of a multiplicity of plasma-depleted blood collection channels which lead to a single plasma-depleted blood outlet.

4,640,777

MEMBRANE DEVICE FOR STERILITY TESTING

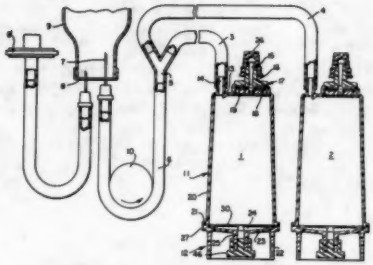
Jean Lemonnier, Le Vesinet, France, assignor to Millipore Corporation, Bedford, Mass.

Filed Dec. 23, 1983, Ser. No. 565,076

Claims priority, application France, Feb. 15, 1983, 83 02391

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—433.2 **10 Claims**



1. In an apparatus for testing the sterility of a fluid comprising at least one hermatically sealed test container wherein each of said containers comprises a top portion and a bottom portion sealed together and each of said containers have first and second ports in a first end thereof and a third port in an opposite end thereof, and each of said containers has a filter support member positioned within said container and spaced from said first end thereof and a first microporous membrane filter supported in a flat position on said filter support member, said first microporous membrane filter having an exposed area which is hydrophilic, said first membrane filter facing said first container end and being sealed about its entire periphery to annular flanges on said top portion and said bottom portion, said annular flanges extending from the interior of said container to a short distance outside said container, said first port including a second membrane filter having a pore size to screen any microorganisms above a predetermined size in a gas passing through said second membrane filter, means for introducing liquid into said container through said second port, means for collecting filtered liquid through said third port and means for capping said first port and said third port, the improvement which comprises said first membrane filter being entirely formed of a hydrophilic microporous material, said first filter membrane having an upper surface and a lower surface and an outer edge, one of the upper or lower surfaces adjacent said outer edge of said first membrane filter being sealed about its entire periphery to either said bottom portion or said top portion the other of said upper or lower surfaces being sealed to the other of said bottom or top portions, the bottom portion being sealed to the top portion about the entire outer edge of the first membrane filter, the portion of said first membrane filter being sealed to said top and bottom portions being substantially free of plastic material forming said top and bottom surfaces and wherein one surface of the first membrane filter is secured to one of the top portion or bottom portion of the container by means of an initial weld effected by direct application of heat and pressure, whereas the other surface of the edge of the first membrane filter is secured to the other of the top or bottom portion of the container by means of a second weld which is formed by a flow of melted container material originating from an area occupying a radial position, beyond the edge of the first membrane filter thereby forming a pressure tight and vacuum tight seal.

4,640,778

FIBRIN GEL-CONTAINING FILTER

Birger Blomback, and Masahisa Okada, both of New York, N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,768

Claims priority, application Sweden, Dec. 30, 1981, 8107864

Int. Cl.[4] C12N *7/02, 1/00;* **B01D** *39/00*

U.S. Cl. 210—484 **41 Claims**

1. A filter comprising fibrin in gel form, said gel having substantially uniform pore sizes, said filter comprising means for retaining the shape of at least the upper surface of said gel against deformation when contacted by a flowing medium, said means for retaining the shape comprising a foraminous sheet member or a foam.

4,640,779

FILTER ELEMENT

Yoshihiro Taki, Nagoya; Hajime Akado, Anjo; Keizo Funae, and Satoshi Inukai, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 15, 1984, Ser. No. 661,188

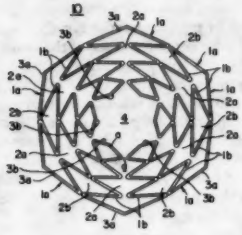
Claims priority, application Japan, Oct. 18, 1983, 58-194605; Feb. 20, 1984, 59-31204; Mar. 12, 1984, 59-47640; Apr. 23, 1984, 59-82762; Jun. 28, 1984, 59-134778; Jun. 28, 1984, 59-134779

Int. Cl.[4] B01D *27/06*

U.S. Cl. 210—493.5 **17 Claims**

1. A filter element including a generally ring-like structure including a plurality of generally radial sections each converging generally radially inwardly and having a plurality of generally circumferential zigzag pleats of a filtering sheet material, said radial sections being circumferentially arranged such that the radially inner ends of of said radial sections cooperate to define a central space disposed substantially centrally of said ring-like structure, the zigzag pleats of each radial section having circumferential dimensions which are substantially gradually decreased radially inwardly of said ring-like structure, the respective circumferential ends of the zigzag pleats of

each circumferentially adjacent pair of radial sections being directed toward each other and disposed in circumferentially adjacent relationship, so that generally radial spaces are defined between said radial sections, some of said radial spaces being radially inwardly open to said central space and being closed at the radially outer ends by said filtering sheet material,



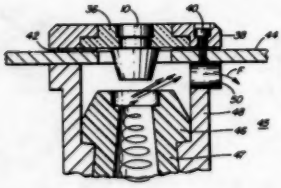
the other radial spaces being closed at the radially inner ends by said filtering sheet material, said radially inwardly open radial spaces and the other radial spaces being circumferentially alternately arranged, and said radially inwardly open radial spaces being closed at the axially opposite ends by end walls.

4,640,780

UNPLUGGING OF HEAVY FRACTION OUTLET HYDROCYCLONE

Jacek J. Maclerewicz, Calgary, Canada, assignor to ELP Products Ltd., Calgary, Canada

Filed May 21, 1985, Ser. No. 736,475
Claims priority, application Canada, Jun. 4, 1984, 455797
Int. Cl.[4] B04C 5/18, 5/23
U.S. Cl. 210—512.2 **13 Claims**



7. A hydrocyclone separator system comprising: a plurality of hydrocyclones having heavy fraction outlets through which a fluid under pressure is exhausted and means for housing said heavy fraction outlets, the housing means defining at least one space which, when in use, is at an elevated pressure, and

in alignment with corresponding ones of said heavy fraction outlets, a plurality of resilient grommets, each resilient grommet comprising a body portion exposed to said elevated pressure in said space, the body portion including a passage for receiving means for unplugging said heavy fraction outlet, the passage including a first portion and a second portion,

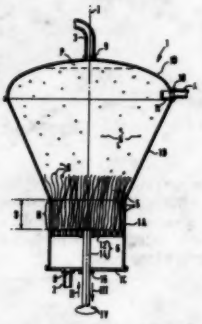
said body portion of said grommet being compressible and deformable under the elevated pressure to (a) cause said first portion of said passage to form a tight leak proof seal around said unplugging means when inserted, and (b) cause said second portion of said passage to close tightly on itself when said unplugging means has been withdrawn to prevent leakage of fluids along such passage.

4,640,781

EXPANDABLE FIBROUS BED COALESCER

Victor B. Hughes, Chester, United Kingdom, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 1, 1985, Ser. No. 718,265
Claims priority, application United Kingdom, Jul. 12, 1984, 8417783
Int. Cl.[4] C02F 1/40
U.S. Cl. 210—520 **8 Claims**



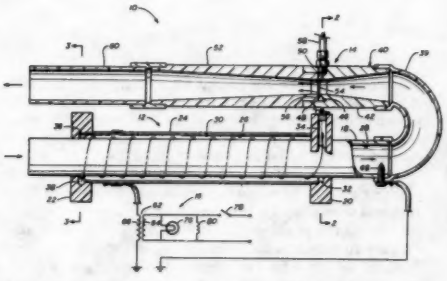
1. Apparatus for treating liquids comprising a housing forming a fluid passage between a fluid feed and a fluid exhaust, and a cluster of fibers arranged in the housing, the housing having a neck portion connected to the fluid feed and another portion having a larger width than the neck portion connected to the fluid exhaust, both housing portions having a common central axis, the cluster of fibers being secured to a support which is displaceable axially relative to the housing and which is operable to be rotated about the central axis.

4,640,782

METHOD AND APPARATUS FOR THE GENERATION AND UTILIZATION OF OZONE AND SINGLET OXYGEN

James C. Burleson, Friendswood, Tex., assignor to Ozo-Tek, Inc., Houston, Tex.

Filed Mar. 13, 1985, Ser. No. 711,257
Int. Cl.[4] C02F 1/78
U.S. Cl. 210—748 **9 Claims**



1. A method for killing pathogens contained within an electrically conductive liquid, with ozone (O_3) and singlet oxygen (O_1) comprising the steps of:

(a) providing an annular chamber defined by (1) a cylindrical body of said electrically conductive liquid forming a first electrical conductor surface, (2) a cylindrical insulated tube confining said liquid, (3) said insulated tube forming a dielectric medium, and (4) a cylindrical metal housing enclosing said tube and forming a second electrical conductor surface;

(b) establishing an elevated electrical force field in said

annular chamber between said first conductor surface and said second conductor surface;

(c) moving a gas containing normally occurring oxygen (O_2) into, through, and out of, said chamber at a moving rate suitably slow to permit ionization within said gas as caused while said gas is within said force field and thereby to transform said normally occurring oxygen (O_2) into the constituents of ozone (O_3) and singlet oxygen (O_1); and,

(d) mixing said gas while containing said constituents immediately with said liquid containing pathogens in a venturi for the purpose of allowing said constituents to react with and to kill said pathogens, wherein said electrically conductive liquid is pumped through said tube and said venturi, and said gas is moved out of said chamber and mixed with said liquid by a vacuum created in said venturi by the pumping of said liquid.

9. In apparatus for killing pathogens contained within an electrically conductive liquid, utilizing ozone (O_3) and singlet oxygen (O_1), the combination comprising:

(a) a flow tube including a first section and a second section for containing a flow of said liquid, each section of said sections comprising substantially cylindrical chambers of dielectric material, said sections being connected such that said conductive liquid flows through both said sections, wherein said conductive liquid comprises a first electrode within said first section;

(b) a second electrode mounted concentrically about said first section and defining an annular chamber between said first section of said flow tube and said second electrode;

(c) a means for establishing an elevated electrical force field in said annular chamber between said first electrode and said second electrode;

(d) means for moving a gas containing normally occurring oxygen (O_2) through said annular chamber at a suitable flow rate to permit ionization within said gas while said gas is within said annular space and thereby transforming said normally occurring oxygen (O_2) into the constituents of ozone (O_3) and singlet oxygen (O_1); and

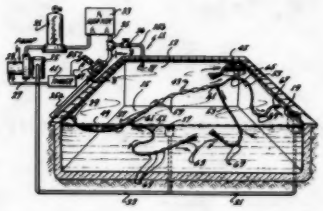
(e) means for mixing said gas including said ozone (O_3) and said singlet oxygen (O_1) with said conductive liquid in a venturi located in said second section and thereby to contact said gas with said pathogens contained within said liquid to react with and kill said pathogens, wherein said means for moving and said means for mixing are constructed to pump said liquid through said flow tube and said venturi to create a vacuum in said venturi and move said gas out of said annular chamber and into said venturi.

4,640,783

OZONE INJECTION METHOD AND APPARATUS

Donald W. Kern, 5290 Orcutt Rd., San Luis Obispo, Calif. 93401

Filed Jun. 10, 1985, Ser. No. 742,934
Int. Cl.[4] C02F *1/78*; E04H *3/20*
U.S. Cl. 210—760 **9 Claims**



1. A method of injecting ozone into the water of a swimming pool comprising:

providing a swimming pool cleaner which includes a movable head, a water-responsive drive coupled to the head, and at least one flexible conduit coupled to said head and having at least one opening therein;

placing the head and the flexible conduit into a swimming pool;

supplying water under pressure to the flexible conduit to cause movement of the flexible conduit to clean a surface of the swimming pool and to the water-responsive drive to cause the head to move about in the pool; and

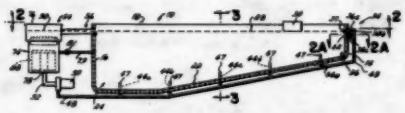
injecting ozone into the water under pressure supplied to the flexible conduit discharging the ozone carried through the flexible conduit and out of said opening to mix with the water in the swimming pool.

4,640,784

METHOD AND APPARATUS FOR CLEANING SWIMMING POOLS

Peter R. Cant, Woollahra, Australia, assignor to Cant Investments Pty. Limited, New South Wales, Australia

Filed Jul. 29, 1985, Ser. No. 760,123
Int. Cl.[4] C02F *1/40*
U.S. Cl. 210—776 **31 Claims**



1. A method of cleaning debris from the pool water of a swimming pool having a bottom, opposed sidewalls, opposed endwalls and a weir mounted in an opening formed in one of the endwalls and extending into the pool, comprising:

spraying water in pressurized streams into the pool to move a surface layer of the pool water toward the endwall having the weir;

applying a suction force to the pool water at the weir for drawing the pool water and debris contained therein into the weir from the pool;

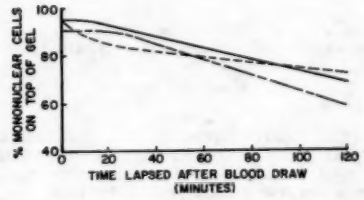
filtering the debris from the pool water entering the weir.

4,640,785

SEPARATION OF LYMPHOCYTES AND MONOCYTES FROM BLOOD SAMPLES

Richard J. Carroll, Syracuse, N.Y.; Albert A. Luderer, Marshfield, Mass.; Ward C. Smith, Painted Post, and Anthony R. Zine, Jr., Corning, both of N.Y., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Dec. 24, 1984, Ser. No. 685,801
Int. Cl.[4] B01D *21/26*
U.S. Cl. 210—782 **13 Claims**



1. A method for separating lymphocytes and monocytes from granulocytes in a sample of anticoagulated unseparated whole blood wherein an apparent shift in the buoyant density of the granulocytes is inhibited an any loss in buoyant density of the granulocytes is restored which comprises the steps of:

(a) incubating said sample of anticoagulated unseparated

whole blood with a fluid selected from the group consisting of a hypertonic fluid containing a low molecular weight organic ionic substance which is essentially chemically compatible with the blood cells, a hypertonic fluid containing a low molecular weight inorganic ionic substance which is essentially chemically compatible with the blood cells, an isotonic fluid containing a high molecular weight organic substance which is essentially chemically compatible with the blood cells, a hypertonic fluid containing a high molecular weight organic substance which is essentially chemically compatible with the blood cells, a culture medium for blood cells and combinations thereof, said incubation of said sample of anticoagulated unseparated whole blood with said fluid being maintained for a sufficient length of time to inhibit the apparent shift in the buoyant density of the granulocytes and restore any loss in the buoyant density of the granulocytes;

(b) placing a water-insoluble, thixotropic gel-like substance which is chemically inert to blood constituents and said fluid into the blood-fluid mixture resulting from step (a);

(c) centrifuging the blood-fluid gel mixture of step (b) at a force and for a sufficient length of time to cause said gel-like substance to flow sufficiently to form a barrier between the lymphocytes and monocytes and the granulocytes; and then

(d) removing the lymphocytes and monocytes from atop said barrier.

4,640,786

PHOSPHONIUM SALT-CONTAINING CORROSION INHIBITORS FOR HIGH DENSITY BRINES

Mark E. Soderquist; Ramaiah Muthyala; William A. Larson, and Peter A. Doty, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1983, Ser. No. 538,451
Int. Cl.[4] C09K 7/02; C23F 11/04, 11/167
U.S. Cl. 252—8.551 28 Claims

1. A composition comprising:

(a) a high density brine comprising $ZnBr_2/CaBr_2$; and

(b) a corrosion-inhibiting amount of an agent comprising at least one phosphonium salt represented generally by the formula:

$$R_aP^+(R')_bX^-$$

wherein "a" is 0, 1 or 2; b is the quantity (4—a); R is alkyl, alkenyl or alkynyl, R' is a saturated or unsaturated hydrocarbyl moiety, and X^- is an anion.

22. A process of inhibiting corrosion of metals which are in contact with a high density brine which brine comprises $ZnBr_2/CaBr_2$, the process comprising dissolving in the brine a corrosion inhibiting agent comprising at least one phosphonium salt represented generally by the formula:

$$R_aP^+(R')_bX^-$$

wherein "a" is 0, 1 or 2; b is the quantity (4–a); R is alkyl, alkenyl or alkynyl, R' is a saturated or unsaturated hydrocarbyl moiety, and X^- is a anion.

4,640,787

GASOLINE COMPOSITIONS CONTAINING BRANCHED CHAIN AMINES OR DERIVATIVES THEREOF

Alexander D. Schuettenberg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 364,361, Apr. 1, 1982. This application Jun. 22, 1984, Ser. No. 623,069
Int. Cl.[4] C10M 133/16
U.S. Cl. 252—51.5 A 13 Claims

1. A detergent additive comprising a reaction product of (a) a C_{8-30} branched chain monoamine having at least 7 carbon atoms in a straight chain and (b) a C_{1-12} monocarboxylic acid or ester.

4,640,788

HYDROCARBON COMPOSITIONS CONTAINING POLYOLEFIN GRAFT POLYMERS

Maria M. Kapuscinski, Carmel; Christopher S. Liu, Poughkeepsie; William P. Hart, Beacon, and Larry D. Grina, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,635
Int. Cl.[4] C10M 145/00, 149/00
U.S. Cl. 252—51.5 R 45 Claims

1. A graft polymer comprising an oil-soluble, substantially linear, carbon-carbon backbone polymer having graft polymerized thereon units derived from, as a functional monomer, the reaction product of (i) an unsaturated aldehyde or ketone and (ii) a primary or secondary amine which contains at least one nitrogen atom in a heterocyclic ring.

2. A graft polymer as claimed in claim 1 wherein said backbone polymer is a copolymer of ethylene-propylene or a terpolymer of ethylene-propylene-diene monomer.

4,640,789

ORE FLOTATION AND FLOTATION AGENTS FOR USE THEREIN

Clarence R. Bresson, and Rector P. Louthan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 608,825, May 10, 1984, Pat. No. 4,515,687. This application Feb. 12, 1985, Ser. No. 701,005
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] C09K 3/00; B03D 1/06
U.S. Cl. 252—61 10 Claims

5. A composition represented by the formula

$$R^1R^2NR^3OCR^4SH,$$

wherein R^1 is selected from the group consisting of alkyl radicals each having no more than 6 carbon atoms, R^2 is selected from the group consisting of alkyl radicals each having no more than 6 carbon atoms, R^3 is selected from the group consisting of alkylene radicals each having no more than 6 carbon atoms, R^4 is an ethylene radical, and R^1 and R^2 can be the same or different.

4,640,790

DISPERSANT COMPOSITION FOR MAGNETIC MEDIA

Judith M. Sylvester, Midland, and David J. Kimball, Remus, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 14, 1986, Ser. No. 885,109
Int. Cl.[4] C04B 35/04; H01F 1/26; C07F 9/02
U.S. Cl. 252—62.54 20 Claims

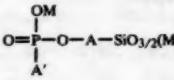
1. A composition comprising the reaction product of: (a) from about 3 to 9 parts by weight of a phosphate ester represented by the formula

$$X_mP{=}O$$
$$|$$
$$(OH)_{3-m}$$

wherein X is independently selected -from the group consisting of RO—, $RO(R'O)_n$—and

in which R represents an alkyl radical having from 2 to 18

carbon atoms, R' is an alkylene group having 2 to 4 carbon atoms, R'' is an alkyl radical having 6 to 18 carbon atoms, n is an integer between 1 and 150 and the average value of m is between 1 and 2; and (b) from about 0.5 to 7 parts by weight of an alkali siliconate silylalkylphosphonate represented by the formula



wherein A' is a hydrocarbon radical having from 1 to 18 carbon atoms, A is a divalent aliphatic hydrocarbon radical containing 1 to 4 carbon atoms or the benzylene radical, M is a cation selected from the group consisting of sodium, potassium, lithium, rubidium, ammonium and tetraorgano ammonium and k may have an average value of 0 to 3.

4,640,791

WATER-BASED FUNCTIONAL FLUIDS THICKENED BY THE INTERACTION OF AN ASSOCIATIVE POLYETHER THICKENER AND CERTAIN FATTY ACID AMIDES

Charles F. Deck, Trenton, and James E. Carson, Lincoln Park, both of Mich., assignors to BASF Corporation, Wyandotte, Wis.

Filed Jan. 30, 1985, Ser. No. 696,406
Int. Cl.[4] C10M *173/00, 119/18, 133/16*
U.S. Cl. 252—75 **6 Claims**

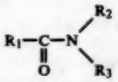
1. A functional fluid comprising

(a) from about 60.0 percent by weight to about 99.0 percent by weight of a diluent;

(b) from about 1.0 percent by weight to about 25.0 percent by weight of a thickener component comprising in effective amounts

(i) an associative polyether thickener, and

(ii) a fatty acid amide having the following chemical structure:



wherein R_1 is individually an alkyl radical having 8 to 18 carbon atoms, and R_2 and R_3 are individually hydroxyalkyl radicals having 1 to 4 carbon atoms.

4,640,792

SILICONE BRAKE FLUID HAVING REDUCED AIR SOLUBILITY

Eugene D. Groenhof, Freeland; David J. Romenesko, and Rick D. Streu, both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 25, 1985, Ser. No. 801,448
Int. Cl.[4] C10M *107/50*
U.S. Cl. 252—78.3 **22 Claims**

1. A hydraulic fluid composition, consisting essentially of: a random silicone copolymer having the general formula $(R')_3—SiO[R(CH_3)SiO]_x[(CH_3)_2SiO]_y—Si(R')_3$, wherein R is selected from the group of alkyl radicals having five to ten carbon atoms, such that the ratio, defined by $x/(x+y)$, is between 0.5 and 0.7 when R is pentyl; said ratio is between 0.25 and 0.7 when R is hexyl; said ratio is between 0.1 and 0.7 when R contains from seven to ten carbon atoms; R' is an organic radical selected from the group consisting of an alkyl group having one to eight carbon atoms and phenyl; and said copolymer has a viscosity between 15 and 50 cS at 25° C.

4,640,793

SYNERGISTIC SCALE AND CORROSION INHIBITING ADMIXTURES CONTAINING CARBOXYLIC ACID/SULFONIC ACID POLYMERS

Leonard J. Persinski, Pittsburgh; Jerry L. Walker, Coraopolis, and Bennett P. Boffardi, Bethel Park, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 578,331, Feb. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 472,808, Mar. 7, 1983, abandoned. This application May 9, 1985, Ser. No. 732,466
Int. Cl.[4] C02F *5/12, 5/10;* **C23F** *11/00;* **C08F** *220/56*
U.S. Cl. 252—82 **6 Claims**

1. An admixture useful for inhibiting the formation of scale forming salts in an aqueous system comprising:

(a) a water-soluble polymer having a weight average molecular weight of less than 25,000, as determined by light scattering, selected from the group of polymers comprising:

(i) an unsaturated mono-carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid; and

(ii) an unsaturated sulfonic acid selected from the group consisting of 2-acrylamido-2-methypropyl sulfonic acid and 2-methacrylamido-2-methylpropyl sulfonic acid;

wherein the weight ratio of (i):(ii) range from about 1:4 to about 4:1; and

(b) at least one member selected from the group comsisting of: alkyl phenoxy poly(ethyleneoxy)ethanols and propylene terminated ethylene oxide adducts, low molecular weight homopolymers of maleic acid or anhydride, low molecular weight polyacrylic acids, phosphino carboxylic acid, low molecular weight copolymers of acrylamide and acrylate, about 60/40 copolymers of acrylic acid and 2-hydroxypropyl acrylate, copolymers of maleic acid or anhydride and sulfonated styrene and sulfonated polystyrenes;

wherein the weight ratio of (a):(b) is about 1:10 to about 10:1.

4,640,794

IMPULSE ROCKET PROPELLANT

Masao Tomita, Nagoya, Japan, assignor to Kinki Denki Co., Ltd., Nagoya, Japan

Filed Aug. 26, 1983, Ser. No. 526,631
Claims priority, application Japan, Apr. 4, 1983, 58-59085
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—194 **8 Claims**

1. A composition useful for propelling an impulse rocket, which when rapidly heated by an electrical current gives off steam to propel an impulse rocket and to produce a trail of ionized salts consisting essentially of about 20 to about 80 wt. % boric acid hydrate, about 10 to about 40 wt. % plaster forming agent comprising about 5 to about 25 wt. % sodium sulfate hydrate, and from about 10 to about 40 wt. % inorganic fiber.

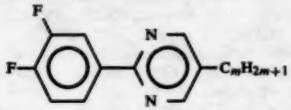
4,640,795

5-ALKYL-2-(3,4-DIFLUOROPHENYL)PYRIMIDINE AND NEMATIC LIQUID CRYSTAL COMPOSITION CONTAINING SAME

Tetsuya Ogawa; Kisei Kitano; Yasuyuki Goto; Masahiro Fukui, all of Yokohamashi, and Shigeru Sugimori, Fujisawashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 21, 1986, Ser. No. 842,190
Int. Cl.[4] C09K *19/34;* **G02F** *1/13;* **C07D** *239/00*
U.S. Cl. 252—299.5 **9 Claims**

1. A 5-alkyl-2-(3,4-difluorophenyl)pyrimidine expressed by the formula



wherein m represents an integer of 1 to 8.

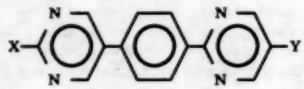
4,640,796

1,4-DIPYRIMIDINYLBENZENE DERIVATIVE

Nsoyuki Yoshida, Kamakurashi; Kisei Kitano, Yokohamashi; Yoshito Furukawa, Yokohamashi; Tetsuya Ogawa, Yokohamashi; Shigeru Sugimori, Fujisawashi; Yasuyuki Goto, Yokohamashi; Toyoshiro Isoyama, Yokohamashi, and Kazunori Nigorikawa, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Nov. 26, 1985, Ser. No. 801,877
Claims priority, application Japan, Dec. 27, 1984, 59-279878
Int. Cl.[4] C09K *19/34;* G02F *1/13;* C07D *403/00*
U.S. Cl. 252—299.61 10 Claims

1. A 1,4-dipyrimidinylbenzene derivative expressed by the formula



(I)

wherein X represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms, methylthio group or cyano group and Y represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms.

4,640,797

PHOSPHORESCENT POLYMER-CONTAINING COMPOSITIONS AND ARTICLES MADE THEREFROM

Peter J. Goguen, Fitchburg, Mass., assignor to Jones and Vining, Incorporated, Leominster, Mass.

Division of Ser. No. 743,528, Jun. 11, 1985. This application May 8, 1986, Ser. No. 861,048
Int. Cl.[4] G01N *21/64;* B01D *1/32;* C08C *11/70*
U.S. Cl. 252—301.36 6 Claims

1. A fluorescent polymeric composition comprising:

(a) about 25–75% by weight of an elastomeric polymer selected from the group consisting of styrenic block copolymers suitable for making footwear, footwear soles, and other footwear parts;

(b) about 20–50% by weight of a processing oil selected from the group consisting of napthenic hydrocarbon oils suitable for use as polymer plasticizers and extenders and mixtures thereof;

(c) about 0.005–1% by weight of a stabilizer selected from the group consisting of hydroxybenzoate ester ultraviolet stabilizers, hindered phenolic anti-oxidant compounds, thioesters of carboxylic acid, and mixtures thereof; and

(d) about 3–30% by weight of a phosphorescent compound, capable of imparting phosphorescent properties to said composition and articles made therefrom.

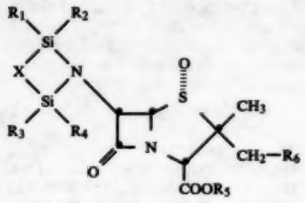
4,640,798

INTERMEDIATES FOR THE PREPARATION OF PENICILLIN AND CEPHALOSPORIN COMPOUNDS

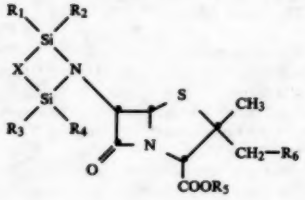
John R. Corfield, Runcorn, and Andrew S. Miller, Marple, both of England, assignors to Lilly Industries Ltd., London, England

Division of Ser. No. 498,234, May 26, 1983, Pat. No. 4,558,124. This application Aug. 2, 1985, Ser. No. 761,717
Claims priority, application United Kingdom, May 26, 1982, 8215418
Int. Cl.[4] C07D *501/02;* A61K *31/545*
U.S. Cl. 540—312 9 Claims

1. A process for preparing a compound of the formula



which comprises combining a penam compound of the formula:



with a peracid oxidising agent and a sufficient amount of base so as to maintain the pH of the process from between about seven to above thirteen; and wherein:

R_1, R_2, R_3 and R_4 are the same or different and are chosen from the group consisting of C_1 to C_4 alkyl, C_1 to C_4 alkoxy, phenyl, and phenyl substituted with from one to three C_1 to C_4 alkyl, nitro, halo and C_1 to C_4 alkoxy groups;

R_5 is a carboxylic acid protecting group;

R_6 is hydrogen, halo, methoxy, acetoxy, formyloxy, azido, nitro, cyano or phenylamino; and

X is an alkylene group of the formula:

$$-(CH_2)_n-$$

wherein n is an integer from one through five.

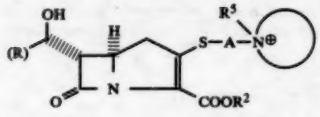
4,640,799

CARBAPENEM ANTIBIOTICS

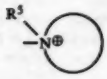
Choung U. Kim, Manlius, and Peter F. Misco, Jr., Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 499,690, Jun. 7, 1983, which is a continuation-in-part of Ser. No. 389,652, Jun. 18, 1982, abandoned. This application Aug. 5, 1985, Ser. No. 762,735
Int. Cl.[4] C07D *487/04;* A61K *31/40*
U.S. Cl. 540—350 7 Claims

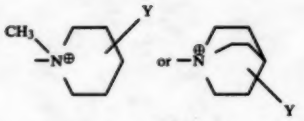
1. A compound of the formula



wherein A is cyclopentylene, cyclohexylene or C_2–C_6 alkylene optionally substituted by one or more C_1–C_4 alkyl groups; R^2 is hydrogen, an anionic charge or a conventional readily removable carboxyl protecting group, providing that when R^2 is hydrogen or a protecting group, there is also present a counter ion; and



represents



wherein Y is hydrogen, C_1–C_6 alkyl, hydroxy, —SC_1—C_6 alkyl, carboxyl, carbamoyl, chloro, bromo, iodo, fluoro or phenyl; or a pharmaceutically acceptable salt thereof.

4,640,800

QUINODIMETHANE COMPOSITIONS

Eui W. Choe, Randolph; Alan Buckley, Berkeley Heights, both of N.J., and Anthon F. Garito, Radnor, Pa., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 25, 1985, Ser. No. 748,583

Int. Cl.[4] C07C *50/02, 50/22*

U.S. Cl. 260—396 N **10 Claims**

9. 13,13-Di(diethylamino)-14,14-dicyano-4,5,9,10-tetrahydropyrenoquinodimethane.

4,640,801

GRAFT POLYOLS

Dominic Simone, Lincroft, and Melvin Brauer, East Brunswick, both of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Continuation-in-part of Ser. No. 581,816, Feb. 21, 1984, abandoned. This application Dec. 12, 1984, Ser. No. 680,705

Int. Cl.[4] C08H *5/00;* **C08F** *242/00, 222/20*

U.S. Cl. 260—407 **34 Claims**

1. A graft polyol comprising the liquid reaction product of:

(a) at least one unsaturated fatty carbon compound having at least 8 carbon atoms, at least one hydroxyl group, and at least one ethylenic double bond, said compound having other than terminal unsaturation;

(b) at least one liquid cyclopentadienyl compound; and

(c) at least one terminally unsaturated monomer having at least one hydroxyl group.

2. The graft polyol according to claim 1 wherein the unsaturated fatty carbon compound is castor oil.

25. A graft polyol comprising the liquid reaction product of:

(a) about 50 to 90 parts by weight of at least one vegetable oil;

(b) about 5 to 40 parts by weight of at least one liquid cyclopentadienyl compound; and

(c) about 1 to 25 parts by weight of at least one of a monoester of acrylic, methacrylic, or crotonic acid and a diol.

4,640,802

PROCESS FOR THE CO-PRODUCTION OF CARBOXYLIC ACIDS AND CARBOXYLIC ACID ESTERS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 7, 1982, Ser. No. 395,952

Claims priority, application United Kingdom, Dec. 10, 1981, 8137359

Int. Cl.[4] C07C *51/12, 67/36, 67/37*

U.S. Cl. 260—410.9 R **20 Claims**

1. A process for the co-production of carboxylic acids of the general formula R^1—COOH and R^2—COOH, and carboxylic acid esters of the general formula $R^1COOCH_2R^2$ and $R^2COOCH_2R^1$, wherein each of the groups R^1 and R^2, which may be the same or different, represents and alkyl group having from 1 to about 20 carbon atoms which may be substituted by one or more inert substituents selected from the group consisting of fluorine or chlorine-containing moieties or hydroxy, alkoxy or alkanoyl groups, or an aryl, alkaryl or aralkyl group which may be substituted by one or more inert substituents selected from the group consisting of fluorine or chlorine-containing moieties or alkoxy or alkanoyl groups, while R^1 may also represent a hydrogen atom, characterized in that a carboxylic acid ester of the general formula R^1—$COOR^2$ and/or ether of the general formula R^3OR^4, wherein R^1 and R^2 are as defined hereinbefore and each of R^3 and R^4, which may be the same or different, represents an alkyl group having from 1 to about 20 carbon atoms which may be substituted by one or more inert substituents selected from the group consisting of fluorine or chlorine-containing moieties or hydroxy, alkoxy or alkanoyl groups, or an aryl, alkaryl or aralkyl group which may be substituted by one or more inert substituents selected from the group consisting of fluorine or chlorine-containing moieties or alkoxy or alkanoyl groups, is reacted with carbon monoxide and hydrogen at a temperature of up to about 300° C. and a pressure of up to about 1000 bar in the presence of a catalytic system which comprises a ruthenium compound and a further compound of a Group VIII metal selected from the group consisting of rhodium and palladium, and a compound of the general formula R^5Hal or R^5COHal where R^5 has one of the meanings given above for R^2 and Hal represents an iodine or bromine atom, the reaction mixture being substantially free from other transition metal or Group II metal iodides or bromides, and containing a tertiary phosphine oxide according to the general formula $OPR^6R^7R^8$, wherein each of R^6, R^7 and R^8, which may be the same or different, represents a substituted or unsubstituted alkyl, cycloalkyl or aryl group having up to 20 carbon atoms, a tertiary phosphine oxide containing two or more phosphorus atoms or the corresponding oxy-acid derivatives according to the general formula $OP(OR^6)(OR^7)(OR^8)$ wherein R^6, R^7 and R^8 each has the meanings as defined hereinabove or phosphonates according to the general formula $OP[(O)_aR^6][(O)_bR^7][(O)_cR^8]$ wherein a, b and c are 0 or 1 and a+b+c is 1 or 2 and R^6, R^7 and R^8 have the meanings as defined hereinbefore.

4,640,803

TUBULAR VENTILATOR

Klaus-Peter Schmidt-Kufeke, Bernhardstr., 7500 Karlsruhe 1, and Gerhard Feld, Am Erl-Anger 3, 8501 Eckenthal, both of Fed. Rep. of Germany

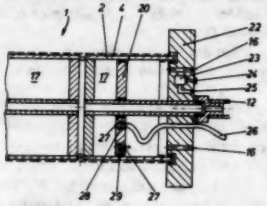
Filed Aug. 16, 1985, Ser. No. 766,816

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—64.3 **14 Claims**

1. A tubular ventilator for introducing gases into liquids, comprising a rigid supporting tube having two spaced ends and being provided with a plurality of radial bores; a hose provided with a plurality of fine pores and surrounding said supporting tube; two covers each tightly closing a respective one of said ends of said supporting tube; means for subdividing the interior of said supporting tube into two tube halves; means for supply-

ing gas into each of said tube halves; at least one hole provided in each of said covers and communicating a respective one of



said tube halves with outside; and two plungers each pressure-tightly displaceable in a respective one of said tube halves.

4,640,804

HUMIDIFIER BLOWOFF PORTION

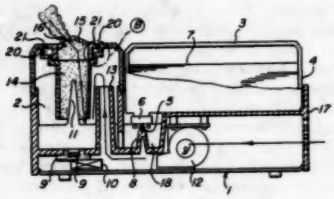
Saburo Mizoguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 1, 1985, Ser. No. 718,228

Claims priority, application Japan, Apr. 2, 1984, 59-48705[U]

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—81 **10 Claims**



1. A humidifier, comprising:

a first chamber means for storing water;

a second chamber means in communication with said first chamber means for receiving water therefrom;

means for atomizing water supplied from said first chamber means to said second chamber means;

a cylinder, provided on an upper wall of said second chamber means, said cylinder providing communication between said second chamber and the atmosphere, the upper portion of the said cylinder having a step-like configuration comprising at least one horizontal wall and at least one vertical wall;

a cap, having a side wall and an opening for discharging atomized water into the atmosphere, said cap being rotatably and detachably secured in the step-portion of said cylinder so as to form a groove between said side wall of said cap and said step portion for inhibiting capillary action of water produced at an interface between said cap and cylinder; and

an eave extending from an upper end of said side wall of said cap for covering said groove.

4,640,805

METHOD OF SELECTIVELY TINTING CAST LENSES

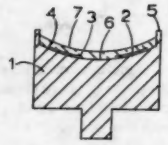
Charles W. Neefe, 811 Scurry St. P.O. Box 429, Big Spring, Tex. 79720

Filed Oct. 7, 1985, Ser. No. 785,247

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—1.1 **16 Claims**

1. A method of coloring selected areas of spin cast contact lenses by the steps of providing a concave spin cast mold having a concave radius equal to the convex lens radius, placing a dye soluble in the lens monomer on the selected areas of the concave mold surface, placing the liquid lens monomer on the concave spin cast mold surface, rotating the spin cast mold around the lens optical axis and perpendicular to the concave spin cast mold surface, allowing the liquid lens monomer to



dissolve the soluble dye present on the concave mold surface, allowing the liquid lens monomer containing the soluble dye to polymerize and form a solid contact lens and the dye being contained within the selected areas of the lens, removing the colored lens from the spin cast mold.

4,640,806

PROCESS FOR ATOMIZING LIQUID METALS TO PRODUCE FINELY GRANULAR POWDER

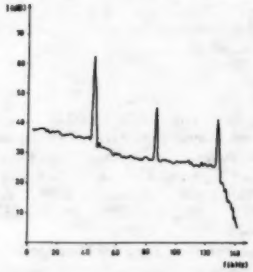
Thomas Duerig, Fremont, Calif.; Marcel Escudier, Mönthal, and Jakob Keller, Killwangen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Division of Ser. No. 583,691, Feb. 27, 1984, Pat. No. 4,575,325. This application Oct. 1, 1985, Ser. No. 782,688

Claims priority, application Switzerland, May 3, 1983, 2389/83

Int. Cl.⁴ B22F *9/08*

U.S. Cl. 264—9 **4 Claims**



1. An improved process for atomizing liquid metals to produce a finely granular powder by disintegrating a jet of liquid metal by means of a gas jet running concentrically with the jet of liquid metal, said gas being directed towards the interior of the jet of liquid metal, forming an enveloping sheath, being annular and having superposed sound vibrations, said improved process being characterized in that the gas jet, in addition to having a continuous band of sound frequencies, contains at least one more discrete sound frequency whose intensity is at least 5 decibel above the average of that of the continuous band and whose pressure amplitude reaches at least the same level as the static stationary pressure of the driving gas used for producing the gas jet.

4,640,807

PROCESS FOR THE PREPARATION OF SILICA SPHERES

Madjid Afghan, and Josephus G. Sponselee, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 24, 1985, Ser. No. 758,623

Claims priority, application United Kingdom, Aug. 2, 1984, 8419708

Int. Cl.[4] C01B *33/12*

U.S. Cl. 264—13 15 Claims

1. A process for the preparation of silica spheres which comprises:

(a) preparing a silica hydrosol by mixing an aqueous solution of an alkali metal silicate with an aqueous solution of an acid;

(b) converting the hydrosol into droplet form;

(c) aging the droplets in a fluid to produce hydrogel particles;

(d) partially drying the hydrogel particles at 10° to 60° C. in air having a relative humidity in the range of from 45 to 95%, to a water content in the range of from 0.3 to 1.3 kg/kg solids;

(e) decreasing the cation content of the hydrogel particles by ion-exchange in an aqueous medium to less than 10%w, calculated on dry material; and

(f) finally drying the hydrogel particles to obtain silica spheres.

4,640,808

METHOD FOR MAKING MAGNETIC ROLLS

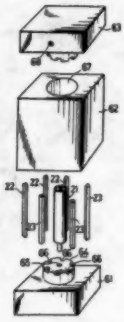
Kunio Okumura, Hachioji; Yasuo Fukuyama, Uji, and Atsuo Tanaka, Yawata, all of Japan, assignors to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Division of Ser. No. 368,998, Apr. 16, 1982, Pat. No. 4,517,719. This application Jan. 18, 1985, Ser. No. 692,681

Claims priority, application Japan, Apr. 20, 1981, 56-59958; Mar. 12, 1982, 57-39916

Int. Cl.[4] B29C *45/14, 67/22;* B21B *27/00;* G03G *15/09*

U.S. Cl. 264—46.5 8 Claims



1. A method for the manufacture of a magnetic roll having a rigid synthetic resin or synthetic resin foam retaining layer and individual spaced-apart magnets arranged and held fast around the periphery thereof, comprising the steps of:

(a) mounting a middle mold member, having a cylindrical bore, on a lower mold member provided with a protruding cylindrical base containing a roll shaft insertion hole at the center thereof and spaced-apart magnet insertion grooves around the periphery thereof;

(b) inserting a roll shaft into said roll shaft insertion hole, while inserting said individual magnets into said magnet insertion grooves and setting the magnets upright within the circular bore of said middle mold member;

(c) placing an upper mold member, having a protruding cylindrical base with spaced apart magnet insertion grooves around the periphery thereof and a synthetic resin injection hole, on said middle mold member while inserting said magnets in said magnetic insertion grooves of said upper mold to retain said magnets in predetermined positions;

(d) assembling said upper, lower and middle mold members to form a closed mold;

(e) introducing a synthetic resin or synthetic resin foam, which is formulated to provide a rigid finished retaining layer of at least 40 Shore hardness, into said mold through the synthetic resin injection hole;

(f) curing or solidifying the synthetic resin or synthetic resin foam introduced into the closed mold in step (e) to provide said rigid finished retaining layer of at least 40 Shore hardness; and

(g) separating the mold members to obtain said magnetic roll.

4,640,809

METHOD FOR MANUFACTURING A CERAMIC HEATER

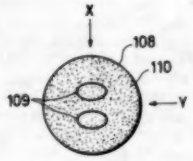
Shinichi Yokoi, and Tsuneo Ito, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Division of Ser. No. 549,327, Nov. 7, 1983, Pat. No. 4,502,430. This application May 3, 1984, Ser. No. 606,606

Claims priority, application Japan, Nov. 8, 1982, 194767; Nov. 8, 1982, 194768

Int. Cl.[4] B24B *11/00*

U.S. Cl. 264—61 5 Claims



1. A method of manufacturing an elongated ceramic heater, comprising the steps of:

forming an elongated U-shaped heating coil by bending an elongated helical coil having a circular cross section into a U-shaped form having two generally parallel helical coil portions and a bend at one end of said U;

embedding said U-shaped coil in a ceramic powder;

forming said powder into a preform having a generally rectangular cross section with the bend in said U-shaped coil adjacent one end of said preform;

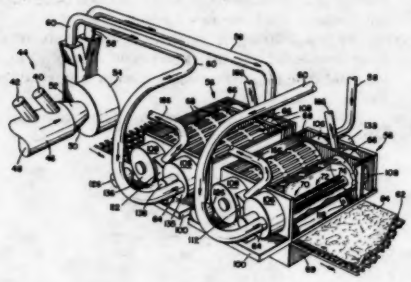
compacting and sintering said preform to reduce the longer cross-sectional dimension of said rectangle thereby deforming each of said helical coil portions of said U-shaped coil into an oval cross section, wherein each of said deformed coils has an oval cross section, wherein planes passing through the long cross-sectional dimension of each of said ovals would be substantially parallel to one another and a plane passing through the short cross-sectional dimension of each said ovals would be substantially coplanar, said compacted and sintered article having a substantially circular cross section; and

grinding the outer periphery of said compacted and sintered article to form a product having a circular cross section.

4,640,810
SYSTEM FOR PRODUCING AN AIR LAID WEB

Henning Laursen, Aarhus; John Mosgaard, Risskov; Otto V. Nielson, Aarhus, all of Denmark, and Clark L. Poland, New Canaan, Conn., assignors to Scan Web of North America, Inc., New Canaan, Conn.

Filed Jun. 12, 1984, Ser. No. 619,946
Int. Cl.[4] B27N 1/00
U.S. Cl. 264—518 44 Claims



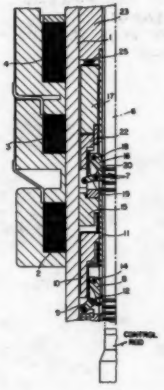
1. A process for forming an air laid web of predetermined characteristics comprising the steps of:
(1) forming a stream of roughly graded material of first loose fibers and at least one of
(a) second loose fibers
(b) particles,
(2) directly and controllably introducing said stream of material into a mixing zone with air to produce an air-borne stream of said roughly graded material;
(3) forming a recirculating air-borne stream of said roughly graded material and said stream includes some clumps of fibers, called nits;
(4) causing said nits to be removed from said recirculating stream at at least two spaced locations;
(5) introducing said air-borne stream of step (2) into said recirculating stream of step (3);
(6) causing at least a portion of said recirculating stream of roughly graded material to rotate in one direction;
(7) causing an internal portion of said recirculating stream to rotate in an opposite direction to that of step (6);
(8) removing from the perimeter of said recirculating stream roughly graded material at the general location of said contrarotation, material of a predetermined size and shape to be a first finely graded material;
(9) causing said first finely graded material to become a directionalized air-borne stream;
(10) providing a translating zone of a portion of said first finely graded material where said translation is in a direction transverse to said directionalized air-borne stream of step (9); and
(11) providing a second fine grading of said material in said air-borne stream by arresting predetermined sizes and shapes of said first finely graded material in said translating zone to provide said web of predetermined characteristics as a second finely graded material web.

12. Apparatus for forming an air laid web of predetermined characteristics material comprising:
supply means forming a stream of roughly graded material of first loose fibers and at least one of
(a) second loose fibers
(b) particles
and for mixing the roughly graded material with air to produce an air-borne stream thereof;
distributor means forming a recirculating air-borne stream of the roughly graded material adapted to receive the air-borne stream from said supply means, said distributor means including tumbler means causing at least a portion of the recirculating stream of roughly graded material to rotate in one direction and agitating means causing an internal portion of the recirculating stream to rotate in an opposite direction to that of said tumber means, said recirculating stream to have clumps of fibers, called nits;
said tumbler means being a first fine grading means having a plurality of classification apertures extending therethrough being of a predetermined shape, number, and size as specifically related to the types of the roughly graded material desired in said webs of predetermined characteristic introduced to said distributor means;
said agitating means adapted to cause flow through the classification apertures of a first finely graded material;
a plurality of nit removal conduits communicating with said distributor means at spaced locations with reference to said recirculating air-borne stream to remove nits from said stream;
air flow producing means causing the first finely graded material to become a directionalized air-borne stream; and
a foraminous carrier movable in a direction transverse to the directionalized air-borne stream being arranged to be a second fine grade means for arresting predetermined sizes and shapes of the first finely graded material resulting in a translating arrested web of material of predetermined characteristics.

4,640,811
APPARATUS WITH LINEAR MOVEMENT

René Peletan, Saint-Hilaire, France, assignor to Framatome, Courbevoi, France

Continuation-in-part of Ser. No. 209,925, Nov. 24, 1980, abandoned. This application Jun. 22, 1983, Ser. No. 505,899
Claims priority, application France, Dec. 21, 1979, 79 31398
Int. Cl.[4] G21C 7/12
U.S. Cl. 376—228 2 Claims



1. A linear motion device comprising:
(a) an axially movable vertical drive shaft provided with a plurality of circumferential grooves equally spaced in the vertical direction, said drive shaft being arranged for connection with a nuclear reactor control rod at the lower end thereof, and
(b) two gripping devices axially spaced relative to said drive shaft, each of said devices having:
(i) a set of identical pawls each pivotally connected to a first support for pivotal movement about an upper horizontal axis into and out of engagement with said grooves,
(ii) an actuation member axially movable between a first position and a second position with respect to said support, and
(iii) link means pivotally connected to said pawls about a

lower horizontal axis located at a level lower than said upper axis and pivotally connected to said actuation member, said link means being located and dimensioned for causing pivotal movement of said pawls into engagement with said grooves responsive to movement of said actuation member into its first position and out of engagement with said grooves upon movement of said actuation member into said second position.

(c) wherein each of said pawls comprises an upper tooth and a lower tooth separated by a vertical distance equal to the distance between two successive grooves of said drive shaft and wherein said lower axis is located at a vertical distance below the tip of said upper tooth which is between one sixth and one fourth of the vertical distance separating the tips of said upper tooth and said lower tooth on one of said pawls.

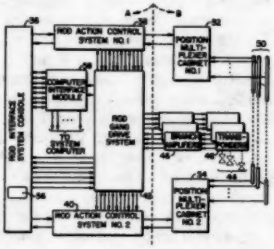
4,640,812

NUCLEAR SYSTEM TEST SIMULATOR

Steven D. Sawyer; William D. Hill; Patricia A. Wilson, and William M. Steiner, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jun. 11, 1984, Ser. No. 619,727
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—245 **8 Claims**

MICROFICHE APPENDIX INCLUDED
(7 Microfiche, 390 Pages)


ROD ACTION CONTROL SYSTEM NO. 1
POSITION MULTIPLEXER CABINET NO. 1
COMPUTER INTERFACE MODULE
ROD INTERFACE SYSTEM CONSOLE
TO SYSTEM COMPUTER
ROD GANG DRIVE SYSTEM
BRANCH DUPLEXER
TRIAXIAL POWERLINK
ROD ACTION CONTROL SYSTEM NO. 2
POSITION MULTIPLEXER CABINET NO. 2

1. A transportable test simulator for a nuclear power plant, the nuclear power plant including a control panel, a reactor having a plurality of actuated rods for moving into and out of a reactor for causing said plant to operate, and a control rod network extending between said control panel and said reactor rods, said network serially transmitting command words between said panel and rods, said network further having connecting interfaces at preselected points remote from said control panel between said control panel and rods, said test simulator comprising:

a test simulator input for transport to and connection into said network at at least one said interface for receiving said serial command words from said network, each said serial command including an identifier portion and a command portion;

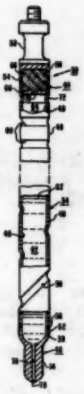
means for processing interior of said simulator for said serial command words for identifying that portion of said power plant designated in said identifier portion and processing said word responsive to the command portion of said word after said identification; means for generating a response word responsive to said command portion; and output means for sending and transmitting said response word to said nuclear power plant at said interface whereby said control panel responds to said response word.

4,640,813

SOLUBLE BURNABLE ABSORBER ROD FOR A NUCLEAR REACTOR

Pratap K. Doshi, and John F. Wilson, both of Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1984, Ser. No. 654,625
Int. Cl.[4] G21C *7/04, 7/10*
U.S. Cl. 376—327 **8 Claims**



1. A soluble burnable absorber rod, comprising:

(a) an elongated hollow tubular member having opposite ends and a hermetically sealed chamber defined therein between its said opposite ends, said tubular member including

(i) a tubular body of thin wall construction and having reinforcing means defined therein, said reinforcing means taking the form of convolutions formed in said body, and

(ii) a pair of end plugs attached to opposite ends of said body so as to hermetically seal the same;

(b) a neutron absorber material in liquid form contained in said sealed chamber within said tubular member;

(c) means providing a hydride sink disposed at one end of said tubular member and in communication with said sealed chamber, said sink being provided by one of said end plugs of said tubular member; and

(d) means providing a hydrogen getter disposed at the other end of said tubular member and in communication with said sealed chamber, said means providing said getter being in the form of

(i) a sponge of getter material disposed adjacent the other end plug of said tubular member, and

(ii) a retainer disposed between said sponge and said chamber for positioning said sponge within said member and having a passageway formed therein for providing communication between said chamber and said sponge.

4,640,814

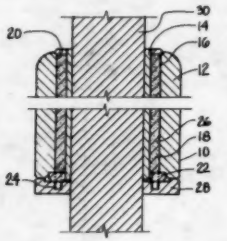
METHOD FOR PRODUCING CLAD TUBULAR PRODUCT

Walter T. Haswell, Jr., Jamesville, N.Y.; Karl S. Brosius, Burgettstown; Scott B. Justus, Wexford, both of Pa., and David A. Salvatora, Gibsonia, Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1985, Ser. No. 788,413
Int. Cl.[4] B22F *7/00*
U.S. Cl. 419—8 **11 Claims**

1. A powder-metallurgy method for producing tubular product having on a metal surface thereof a cladding of an alloy of a metallurgical composition different from said sur-

face, said method comprising constructing an assembly including a metal tubing having at least one surface to be clad, a tubular insert mounted generally axially with said tubing in spaced-apart relation to said surface to provide a generally annular cavity between said surface and said tubular insert, filling said cavity with metal particles of a metallurgical composition different from said surface, sealing said powder-filled cavity, heating said assembly to an elevated temperature and



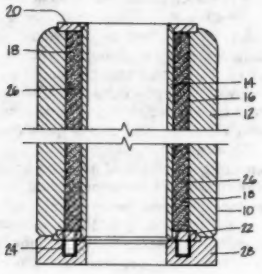
simultaneously forging said assembly to compact said metal particles to substantially full density and metallurgically bond said particles to said surface, said forging including passing said assembly along a feed path having an axis through a forging box having a plurality of hammers evenly spaced around said assembly and adapted to extend and retract radially with respect to said axis to impart a radial forging action to said assembly as said assembly passes through said forging box.

4,640,815

METHOD AND ASSEMBLY FOR PRODUCING EXTRUSION-CLAD TUBULAR PRODUCT

Karl S. Brosius, Burgettstown; Scott B. Justus, Wexford, and David A. Salvatora, Gibsonia, all of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1985, Ser. No. 788,416
Int. Cl.⁴ B22F 7/00
U.S. Cl. 419—8 **8 Claims**



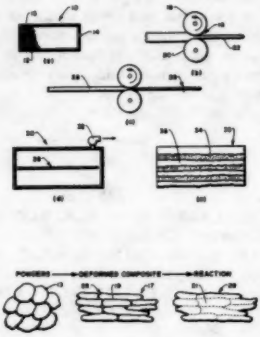
1. A powder-metallurgy method for producing a tubular product having on a metal surface thereof a cladding of an alloy of a metallurgical composition different from said surface, said method comprising constructing an assembly including a metal tubing having at least one surface to be clad, a tubular insert mounted generally axially with said tubing in spaced-apart relation to said surface to provide a generally annular cavity between said surface and said tubular insert, filling said cavity with metal particles of a metallurgical composition different from said surface, sealing said powder-filled cavity, heating said assembly to an elevated temperature and simultaneously extruding said assembly to compact said metal particles to substantially full density and metallurgically bond said particles to said surface, whereby surface cladding on tubing is produced.

4,640,816

METASTABLE ALLOY MATERIALS PRODUCED BY SOLID STATE REACTION OF COMPACTED, MECHANICALLY DEFORMED MIXTURES

Michael Atzmon, Herzlia, Israel; William L. Johnson, Pasadena, Calif., and John D. Verhoeven, Ames, Iowa, assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 31, 1984, Ser. No. 645,847
Int. Cl.⁴ B22F 1/00
U.S. Cl. 419—24 **15 Claims**



1. A method of forming solid, metastable, amporphous metal materials comprising the step of:

forming a mixture of solid, metal precursors of the metastable, amorphous material, at least one of the precursors being in the form of individual, discrete, solid units and said mixture containing metals A and Z where A is an early transition metal selected from Group IIIB, IVB, or VB and Z is a late transition metal selected from Group VIIB, VIII or IB or the mixture is formed of a transition metal selected from IB, VIB, VIIB or VIII with a metalloid selected from Group IIIA, IVA, or VA;

consolidating the mixture by cold working the consolidated mixture to reduce the thickness of the said discrete units of precursor by a factor of at least 10; and

heating the cold-worked mixture at a temperature lower than the transformation temperature at which the metastable phase transforms into a more stable crystalline phase for a time sufficient to form a solid, metastable, amorphous, metal material.

2. A method according to claim 1 in which the metastable amorphous metal material is selected from YCu, YCo, YAu, YNi, YFe, ZrFe, ZrCu, ZrNi, ZrCo, TiNi, TiFe, TiCu, NbNi or AuLa.

11. A method according to claim 1 in which the heating is conducted in an inert environment.

12. A method according to claim 11 in which the ratio of the rate of forming metastable material to the rate of forming stable crystalline phases is at least 10^2.

4,640,817

DUAL-PHASE STAINLESS STEEL WITH IMPROVED RESISTANCE TO CORROSION BY NITRIC ACID

Haruhiko Kajimura, Nishinomiya; Hiroo Nagano, and Minoru Miura, both of Kobe, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

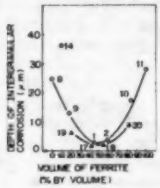
Filed Jul. 27, 1984, Ser. No. 635,108
Claims priority, application Japan, Aug. 5, 1983, 58-142518
Int. Cl.⁴ C22C 38/40
U.S. Cl. 420—50 **14 Claims**

1. A dual phase stainless steel exhibiting improved resistance to corrosion caused by nitric acid, which consists essentially of:

C: not more than 0.02% by weight;

Si: more than 2% by weight, but not more than 6% by weight;

Mn: 0.1–2% by weight; Cr: 22–35% by weight; Ni: 3–27% by weight; P: not more than 0.02% by weight; N: not more than 0.30 by weight;



Fe and incidental impurities: balance; and wherein the amount of ferrite is 30–70% by volume.

4,640,818

CORROSION INHIBITION OF METALS IN WATER SYSTEMS USING AMINOPHOSPHONIC ACID DERIVATIVES IN COMBINATION WITH MANGANESE

Jeffrey G. Grierson, Angleton; Carol A. Jones, Sweeny, and William D. Spears, West Columbia, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 641,649, Aug. 17, 1984, abandoned. This application Jun. 13, 1985, Ser. No. 744,190

Int. Cl.[4] C23F *11/18, 11/16;* C09K *3/00*

U.S. Cl. 422—15 **75 Claims**

1. A composition useful in inhibiting metal corrosion in water conducting systems comprising, in combination, (a) an organic aminophosphonic acid derivative, wherein the nitrogen and phosphorus are inter-connected by an alkylene or substituted alkylene radical having the formula

wherein X, Y are independently selected from hydrogen, hydroxyl, carboxyl, phosphonic, salts of the acid radicals and hydrocarbon radicals having from 1–12 carbon atoms and wherein n is 1–3, with the proviso that when $n>1$, each X and Y may be the same as or different from any other X or Y on any carbon atom, and (b) a manganese compound capable of providing a manganese ion.

4,640,819

STRESS CRACK REDUCTION IN POLYCARBONATE PARTS

David P. Balding; Li-Chien Hsu, both of Mission Viejo, and Lucas S. Gordon, Laguna Beach, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 19, 1985, Ser. No. 746,355

Int. Cl.[4] A61L *2/08, 2/20*

U.S. Cl. 422—22 **9 Claims**

1. In a method of providing assemblies of polycarbonate parts which are in surface contact with polyvinyl chloride tubing, the improvement which comprises the step of reducing stress cracking in said polycarbonate parts by limiting the polyvinyl chloride tubing in contact therewith to plasticized polyvinyl chloride tubing produced using a trimellitate as the primary plasticizer.

3. The method of claim 1, further comprising the step of exposing said tubing and parts to about 3 Mrad of gamma radiation.

4,640,820

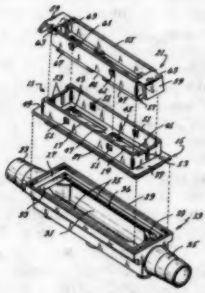
FLOW-THROUGH HOUSING WITH BLOOD GAS SENSORS

Robert P. Cooper, Yorba Linda, Calif., assignor to Cardiovascular Devices, Inc., Irvine, Calif.

Filed Oct. 28, 1983, Ser. No. 546,493

Int. Cl.[4] G01N *21/05, 33/48*

U.S. Cl. 422—68 **18 Claims**



1. A membrane support apparatus comprising:

a membrane support having first and second recesses;

first and second membranes extending over the first and second recesses, respectively, said first and second membranes being permeable to at least a component of a liquid;

means for mounting the first and second membranes on the membrane support with the membranes extending over the first and second recesses, respectively;

said mounting means including a groove in the membrane support between the recesses, edge portions of said membranes extending into said groove;

said mounting means including means for retaining the edge portions in said groove; and

said edge portions of said first membrane extending into said groove on a side thereof adjacent the first recess, and said second membrane extending over said retaining means on a side thereof facing outwardly of said groove and then extending into said groove to thereby form a smooth transition with said first membrane.

4,640,821

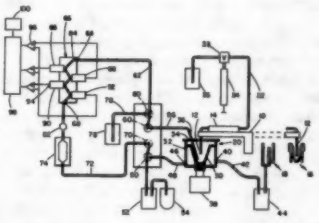
ANALYSIS APPARATUS

Dinesh I. Mody, Bedford; James E. Rasmussen, Hyde Park, and Mikhail Y. Ryaboy, Methuen, all of Mass., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Jul. 16, 1985, Ser. No. 756,149

Int. Cl.[4] G01N *27/26, 35/08*

U.S. Cl. 422—81 **11 Claims**



1. A system for analyzing a biological fluid comprising:

structure defining an analysis region having an inlet and an outlet, a measuring system connected in sensing relation to said analysis region,

structure defining an accumulator chamber that has an inlet

and an outlet, the inlet of said accumulator chamber being connected to the outlet of said analysis region,

an inlet valve array connected to the inlet of said analysis region, an outlet valve array connected to the outlet of said accumulator chamber, structure defining a series flow path that extends between said inlet valve array and said outlet valve array and includes said analysis region and said accumulator chamber,

said accumulator chamber having a volume at least as great as a volume defined by said series flow path, including said analysis region, between said inlet valve array and said accumulator chamber,

structure defining a sample inlet port, means connecting said sample inlet port to said inlet valve array,

a controlled source of reduced pressure, means connecting said controlled source of reduced pressure to said outlet valve array, said outlet valve array being arranged to selectively connect said controlled source of reduced pressure to said series flow path to apply reduced pressure to the outlet of said accumulator chamber,

said inlet valve array being arranged to selectively connect said sample inlet port to said series flow path, and

control means for operating said inlet valve array and said outlet valve array to initially capture reduced pressure in said series flow path, and then to open said inlet valve array so that the captured reduced pressure in said series flow path provides the sole transfer force to gently and reliably transfer a minute quantity of fluid to be analyzed from said sample inlet port through said analysis region and to at least partially fill said accumulator chamber.

4,640,822

APPARATUS FOR PRODUCING BULK MESOPHASE

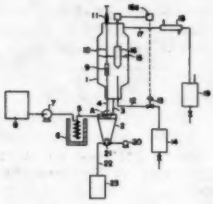
Kosaku Noguchi, Tokyo; Honami Tanaka, Osaka; Yukimasa Kumura, Osaka; Heima Yamazaki, Osaka; Eiji Kitajima, Osaka, and Tomonori Sunada, Osaka, all of Japan, assignors to Koa Oil Company, Limited, Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,550

Claims priority, application Japan, Aug. 11, 1982, 57-139467

Int. Cl.[4] C10C *3/00*; D01F *9/12*

U.S. Cl. 422—111 **3 Claims**



1. An apparatus for producing bulk mesophase comprising; a heat-treatment vessel for heat treating a starting material heavy oil to form pitch containing mesophase microspheres, a separation vessel for agglomerating the mesophase microspheres in the pitch introduced into the separation vessel to thereafter separate the agglomerated mesophase microspheres, and a tank containing a starting material heavy oil operatively connected to said heat-treatment vessel through a starting-material supply pipeline, said separation vessel being positioned below said heat-treatment vessel and having an upper side wall and further being in the shape of an inverted cone wherein said heat-treatment vessel is connected to said separation vessel by a descent pipe and an ascent pipe which are in parallel relationship with each other, said descent pipe having a lower end connected to the upper side wall of the separation vessel and in tangential relation thereto, said ascent pipe having an upper end and a lower end, with the lower end extending coaxially into a central portion of the separation vessel and having a conduit located internally thereof, said conduit having a throat portion of constricted inner diameter, said starting-material supply pipeline having a discharge tip extending coaxially into said ascent pipe, the discharge tip of the starting-material supply pipeline being positioned coaxially in the vicinity of said throat portion so as to draw the matrix pitch into said heat-treatment vessel from said separation vessel by a drawing force of an injection energy created at the throat portion by the starting-material heavy oil injected from the discharge tip of the starting-material supply pipeline, said heat-treatment vessel having a means for controlling the flow rate of supply of the strating material heavy oil and the matrix pitch into the heat-treatment vessel, said means comprising a vertical tubular structure having an open lower end and a closed upper end and accommodating the upper end of said ascent pipe with a specific radial clearance therebetween, and a mechanism connected to the tubular structure and positioned and arranged so as to be operable from outside of the heat-treatment vessel to raise and lower the tubular structure so as to adjustably vary the area of opening of the upper end of said ascent pipe.

4,640,823

ALKALINE LEACHING OF VANADIUM BEARING RESIDUES

John B. Goddard, Grand Island, N.Y., assignor to U.S. Vanadium Corporation, Danbury, Conn.

Filed Mar. 13, 1986, Ser. No. 839,093

Int. Cl.[4] C01G *31/00*

U.S. Cl. 423—68 **19 Claims**

1. A process for recovering vanadium values from vanadium-bearing carbonaceous residues derived from petroleum refining or burning of carbonaceous fuels, and which contain high-acid consuming materials including significant amounts of magnesium, calcium and iron bases, which process comprises the steps of:

(1) leaching said carbonaceous residues with an aqueous solution containing at least one alkaline metal carbonate and at least one alkaline metal hydroxide of from about 4:1 to about 1:4;

(2) separating a vanadium-bearing liquor and

(3) recovering vanadium values therefrom.

4,640,824

PROCESS FOR MAKING ALKALI METAL PHOSPHATE SOLUTIONS CONTAINING LITTLE FLUORINE

Günther Schimmel, and Reinhard Gradl, both of Erfstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 682,053

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 3347421

Int. Cl.[4] C01B *25/16*

U.S. Cl. 423—185 **6 Claims**

1. In the process for making alkali metal phosphate solutions containing little fluorine from pre-purified phosphoric acid solutions obtained from crude phosphoric acid by extracting the acid with an organic solvent being immiscible or only partially miscible with water, scrubbing the crude extract with water or an alkali metal salt solution, re-extracting and neutralizing the phosphoric acid from the scrubbed extract and reducing the fluorine content of the acid by a treatment with an alkaline earth metal compound and separating the resulting organic phase from the purified alkali metal phosphate solution obtained, the improvement which comprises:

(a) reextracting the phosphoric acid from the extract by reacting with an aqueous alkali solution in an amount for establishing in the reaction mixture an alkali metal/P-molar ration equal or greater than 1:1;

(b) suspending or dissolving a defluorination agent consisting essentially of an alkaline earth metal compound in the said alkali solution of said step (a); allowing the reaction between the phosphoric acid extract and the alkaline earth

metal compound containing alkali solution to take place in the mixing zone of the re-extraction unit at 60°–120° C.;

(c) using as a compound of an alkaline earth metal Me^{2+} such having a solubility in water at 20° C. of more than 0.01 mol Me^{2+}/l, whereby alkaline earth metal compounds having a solubility in water of less than 5 g/l being used in the form of particles of which more than 50% have a size of less than 8 μm, allowing the whole to react over a period of 0.5 to 4 hours, and separating the resulting precipitate from the alkali metal phosphate solution so purified.

4,640,825

PROCESS FOR SIMULTANEOUS REMOVAL OF SO_2 AND NO_x FROM GAS STREAMS

Harvey S. Rosenberg, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Mar. 26, 1985, Ser. No. 716,290

Int. Cl.[4] C01B *21/00, 17/00, 21/38, 17/74*

U.S. Cl. 423—235 **16 Claims**

1. A process for simultaneous removal of SO_2 and NO_x from a gas stream comprising:

a. flowing the gas stream to a spray dryer and absorbing a portion of the SO_2 content of the gas stream and a portion of the NO_x content of the gas stream with ZnO by contacting the gas stream with a spray of an aqueous ZnO slurry;

b. controlling the gas outlet temperature of the spray dryer to within the range of a 0° to 125° F. approach to the adiabatic saturation temperature;

c. flowing the gas, unreacted ZnO and ZnO with absorbed SO_2 and NO_x from the spray dryer to a fabric filter and collecting any solids therein and absorbing a portion of the SO_2 remaining in the gas stream and a portion of the NO_x remaining in the gas stream with ZnO; and

d. controlling the ZnO content of the aqueous slurry so that sufficient unreacted ZnO is present in the solids collected in the fabric filter to react with SO_2 and NO_x as the gas passes through the fabric filter whereby the overall feed ratio of ZnO to SO_2 plus NO_x is about 1.0 to 4.0 moles of ZnO per mole of SO_2 and about 0.5 to 2.0 moles of ZnO per mole of NO_x.

4,640,826

METHOD OF MAKING YTTRIUM SILICON OXY COMPOUND

Robert M. Williams, Livonia, and Elaine C. Beckwith, Riverview, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1985, Ser. No. 813,168

Int. Cl.[4] C01F *17/00*

U.S. Cl. 423—263 **10 Claims**

1. A method of making a duo metal oxy compound, comprising:

(a) mixing a powdered hydrated nitrate of a metal selected from the group consisting of cerium and yttrium with silica in molar equivalent amounts to yield, upon heating, a dual oxide compound of silicon and said metal;

(b) agitatingly heating said mixture to the melt and the decomposition temperature of the nitrate; and

(c) heating said mixture resulting from step (b) to a temperature from 1300° to 1550° C. and for a period of time from 2 to 5 hours, and sufficient for the silica and decomposed metal nitrate to chemically react and form a dual oxide compound of silicon and said metal.

4,640,827

TRIHYDRATED POTASSIUM TRIBORATE AND PROCESS FOR REACTING TWO BORATES IN THE SOLID STATE

Christopher G. Salentine, Mill Valley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1985, Ser. No. 783,283

Int. Cl.[4] C01B *35/10*

U.S. Cl. 423—279 **11 Claims**

1. A trihydrated potassium triborate having the following chemical formula:

$$KB_3O_5.3H_2O$$

and wherein said triborate has the following X-ray diffraction parameters: a=15.540(5) Å, b=6.821(2) Å, c=14.273(4) Å and beta=104.44(2)° in the monoclinic space group C2/c.

2. A process for the production of a trihydrated potassium triborate having the following chemical formula:

$$KB_3O_5.3H_2O$$

comprising contacting as solids potassium pentaborate tetrahydrate with dipotassium tetraborate tetrahydrate or dipotassium pentaborate pentahydrate under reaction conditions, said reacting conditions including an atmosphere having more than a 60% relative humidity and a reaction temperature in the range of 35° to 150° F. and a reaction time from 10 to 100 hours or more and insufficient water to completely dissolve said potassium pentaborate, said dipotassium tetraborate, tetrahydrate or said dipotassium pentaborate pentahydrate.

4,640,828

SEPARATION OF DISSOLVED SUBSTANCES FROM WET PROCESS PHOSPHORIC ACID

Arthur N. Baumann, Lakeland, Fla., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 22, 1985, Ser. No. 790,128

Int. Cl.[4] C01B *25/16*

U.S. Cl. 423—321 R **23 Claims**

1. A method of removing magnesium, aluminum, sodium, and fluoride ion impurities from wet process phosphoric acid containing dissolved silicon comprising the steps of:

(a) stripping at least a portion of the dissolved silicon from the wet process phosphoric acid having a P_2O_5 concentration of about 35–45% by heating the acid to a temperature where steam evaporation occurs while maintaining the pressure constant and adding H_2O to keep the concentration within the 34–45% range;

(b) precipitating ralstonite from the stripped acid; and

(c) separating the precipitated ralstonite from the stripped acid.

4,640,829

SYNTHESIS OF CRYSTALLINE SILICATE ZSM-50 USING DIBENZYLDIMETHYLAMMONIUM IONS AND THE PRODUCT PRODUCED

Mae K. Rubin, Bala Cynwyd, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 705,822, Feb. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 684,182, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 600,680, Apr. 16, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 770,943

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **11 Claims**

1. A method for synthesizing a crystalline silicate consisting essentially of one having the structure of ZSM-50 and exhibiting a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, which comprises (i) forming a reaction mixture capable of forming said crystalline silicate, said mixture comprising sources of alkali metal ions, dibenzyldimethylammonium ions, an oxide of silicon, water and an oxide of

aluminum, said reaction mixture having a composition, in terms of mole ratios, within the following ranges:

SiO_2/Al_2O_3	=	>250
H_2O/SiO_2	=	5–30
OH^-/SiO_2	=	0.08–0.3
M/SiO_2	=	0.08–0.3
R/SiO_2	=	0.05–1.0

wherein M is said alkali metal ion and R is said dibenzyldimethylammonium ion, (ii) maintaining the reaction mixture at conditions sufficient to crystallize said silicate, and (iii) recovering the crystalline silicate having the structure of ZSM-50, said recovered crystalline silicate containing alkali metal and dibenzyldimethylammonium ions.

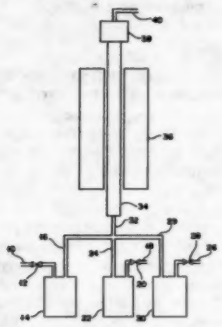
11. Dibenzyldimethylammonium-containing crystalline silicate ZSM-50.

4,640,830

PROCESS FOR PREPARING FINE FIBERS

Kohei Arakawa, Shinada, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 774,015
Claims priority, application Japan, Sep. 13, 1984, 59-192050
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—346 **8 Claims**



1. In a process for preparing fine fibers consisting of carbon and silicon in a gaseous phase reaction, the improvement comprising subjecting a gas mixture comprising at least one transition metal compound gas, at least one organo-silicon compound gas and at least one carbon compound gas to an elevated temperature, said transition metal compound decomposing at the elevated temperature to form metal catalyst in a floating state which induces growth of fine fibers in a floating state, said fine fibers being continuously recovered.

4,640,831

METHOD FOR RECOVERING PROTIC ACIDS USING REVERSIBLE BASES

Robert A. DeVries, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

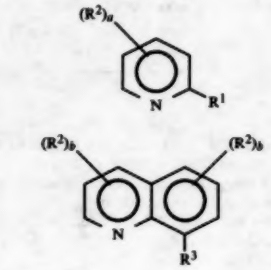
Filed Dec. 18, 1984, Ser. No. 683,439
Int. Cl.[4] C01B *7/01, 7/19, 9/08*
U.S. Cl. 423—481 **16 Claims**

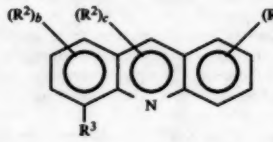
1. A process for the recovery of protic acids from a medium which comprises

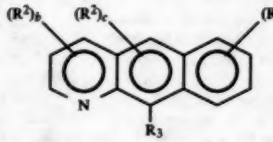
(a) contacting a medium containing a protic acid selected from the group consisting of hydrobromic acid, hydrochloric acid, hydrofluoric acid, and hydroiodic acid which comprises hydrobromic acid, hydrochloric acid, hydrofluoric acid, or an hydroiodic acid with a reversible base under conditions such that the protic acid and the reversible base form a salt; and

(b) exposing the salt of the protic acid and the reversible base to temperatures at which the salt dissociates liberating the protic acid;

wherein the reversible base is a compound corresponding to one of the formulas

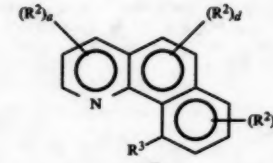






or

or is a polymer containing units corresponding to one of the formulas



or

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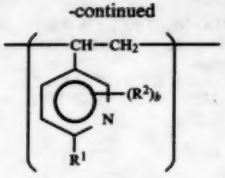


wherein

R^1 is separately in each occurrence C_{2-20} alkyl, C_{6-20} aryl, C_{7-20} alkaryl, C_{7-20} aralkyl or C_{3-20} cycloalkyl, wherein the C_{2-20} alkyl, C_{6-20} aryl, C_{7-20} aralkyl, C_{7-20} alkaryl or C_{3-20} cycloalkyl is unsubstituted or substituted with a halo, nitro, C_{1-20} alkoxy, C_{6-20} aryloxy, C_{7-20} alkaryloxy or C_{7-20} aralkoxy;

R^2 and R^3 are separately in each occurrence C_{1-20} alkyl, C_{6-20} aryl, C_{7-20} alkaryl, C_{7-20} aralkyl, C_{3-20} cycloalkyl, nitro, halo, C_{1-20} alkoxy, C_{6-20} aryloxy, C_{7-20} alkaryloxy or C_{7-20} aralkoxy wherein the C_{1-20} alkyl, C_{6-20} aryl, C_{7-20} alkaryl, C_{7-20} aralkyl, C_{1-20} alkoxy, C_{6-20} aryloxy, C_{7-20} alkaryloxy, C_{7-20} aralkoxy or C_{3-20} cycloalkyl group is unsubstituted or substituted with a halo, nitro, C_{1-20} alkoxy, C_{6-20} aryloxy, C_{7-20} alkaryloxy or C_{7-20} aralkoxy;

a is separately in each occurrence an integer of from 0 to 4;

b is separately in each occurrence an integer of from 0 to 3;

c is separately in each occurrence the integer 0 or 1; and

d is separately in each occurrence the integer of from 0 to 2.

4,640,832

PROCESS FOR THE PRODUCTION OF SODIUM POLYSULFIDES FROM THE ELEMENTS SODIUM AND SULFUR

Friedrich Bittner, Bad Soden; Walter Hinrichs, Brühl; Herbert Hovestadt, Erftstadt; Ludwig Lange, Brühl, and Erich Splett, Hürth-Berrenrath, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 4, 1985, Ser. No. 772,395

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436698

Int. Cl.[4] C01B *17/22, 17/34*

U.S. Cl. 423—562 **18 Claims**

1. A process for the production of pure sodium polysulfide from sodium polysulfides and the elements sodium and sulfur consisting essentially of step: (a) forming an initial melt consisting of sodium polysulfide having an initial sodium to sulfur ratio under a protective gas atmosphere, step (b) adding only one reactant from the group consisting of sodium and sulfur, to form an intermediate melt having a sodium to sulfur ratio different that of the initial melt, step (c) then adding the other of said reactants to the intermediate melt formed in step (b) to change its sodium to sulfur ratio to that of the product polysulfide, the amount of sodium and sulfur added being that to produce the product polysulfide and to convert the initial melt sodium to sulfur ratio to that of the product polysulfide.

4,640,833

USE OF PERFLUOROBROMOALKYL ETHERS AS X-RAY CONTRAST AGENTS

Christ Tamborski, Dayton, and Leland C. Clark, Jr., Cincinnati, both of Ohio, assignors to Adamantech, Inc., Marcus Hook, Pa. and Children's Hospital Research Foundation, Cincinnati, Ohio

Continuation of Ser. No. 470,343, Feb. 28, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 710,931

Int. Cl.[4] A61K *49/04*

U.S. Cl. 424—5 **6 Claims**

1. In a method of radioimaging an internal region of an animal wherein a radiopaque agent is introduced into the region and the region is X-rayed while perfused with the radiopaque agent, the improvement which comprises employing as the radiopaque agent a perfluorobromoalkyl ether of the formula:

$$C_mF_{2m+1}OC_nF_{2n}Br$$

where m and n independently are integers of from 2 to 6.

4,640,834

METHOD OF INACTIVATING REPRODUCIBLE FILTERABLE PATHOGENS IN BLOOD PRODUCTS AS WELL AS A METHOD OF PRODUCING BLOOD PRODUCTS

Johann Eibl; Otto Schwarz; Fritz Elsinger, all of Vienna; Günter Wöber, Oberwaltersdorf; Anton Philapitsch, Ebenfurt; Yendra Linnau, Vienna; Friedrich Dorner, Vienna; Karl Trambauer, Vienna, and Wolfgang Frechinger, Vienna, all of Austria, assignors to Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte, Austria

Filed Feb. 26, 1985, Ser. No. 705,691

Claims priority, application Austria, Mar. 9, 1984, 792/84; Oct. 11, 1984, 3237/84

Int. Cl.[4] A61K *37/465, 37/48*

U.S. Cl. 424—94 **20 Claims**

1. A method of inactivating viable filterable pathogens in a blood product, which comprises: placing said blood product in a solid state in a closeable treating zone in the presence of a hydroxyl group-containing compound selected from the group consisting of water, methanol, ethanol, and mixtures thereof, and closing said treating zone; maintaining the content of said hydroxyl group-containing compound in said treating zone to provide said blood product with a content of hydroxyl group-containing compounds of more than 0.05 (5% by weight) and less than 0.70 (70% by weight); and heating said blood product in the solid state in the closed treating zone at a temperature of between 50° and 121° C. to increase the partial vapor pressure of said hydroxyl group-containing compound, to thereby inactivate viable filterable pathogens.

4,640,835

PLASMINOGEN ACTIVATOR DERIVATIVES

Kimihiro Shimizu, Yoshikawa; Tsuguji Nakahara, Tokyo; Taketoshi Kinoshita, Koshigaya; Jun Takatsuka, Kawasaki, and Michiko Igarashi, Musashino, all of Japan, assignors to Nippon Chemiphar Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 437,009, Oct. 27, 1982, Pat. No. 4,495,285. This application Oct. 28, 1983, Ser. No. 546,590

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] A61K *37/48;* **C12N** *9/96, 9/72*

U.S. Cl. 424—94 **24 Claims**

1. A derivative of a nonimmunogenic human plasminogen activator, comprising at least one polyalkylene glycol chemically bonded with at least one coupling agent to the amino acid side chains of said plasminogen activator, wherein said polyalkylene glycol has a molecular weight in the range of 200–20,000 and is unsubstituted or is substituted with one or more alkyl, alkoxy or alkanoyl groups or a mixture thereof.

4,640,836

PLANT PROTECTION METHOD

Donald Boulter, Durham; Angharad M. R. Gatehouse; John A. Gatehouse, both of Broom Park, and Roger B. Cox, Reading, all of England, assignors to Agricultural Genetics Company, Limited, Cambridge, England

Filed Aug. 13, 1984, Ser. No. 639,856

Claims priority, application United Kingdom, Aug. 19, 1983, 8322446; Nov. 18, 1983, 8330847

Int. Cl.[4] A01N *65/00*

U.S. Cl. 424—195.1 **4 Claims**

1. A method of protecting a plant or a part of the said plant against an invading pest, comprising presenting a pest belong-

ing to the genus Heliothis, Anthonomus, Tribolium, Sitophilus, Chilo, Spodoptera, Ostrinia or Agrotis with a pesticidally effective amount of a cowpea trypsin inhibitor while the said pest is in contact with or in the vicinity of the said plant or said plant part, wherein the said plant is not a cowpea and does not produce cowpea trypsin inhibitor.

4,640,837

COATING COMPOSITION FOR MICROWAVE COOKING

Edward C. Coleman, Cranbury; Jeffrey D. Wagner, Imlaystown; Donna J. Ballard; Catharine E. Stone, both of East Windsor; Nancy A. Swallow, Plainsboro, and Nancy L. Carey, Erial, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 15, 1985, Ser. No. 786,985

Int. Cl.[4] A23L *1/176*

U.S. Cl. 426—94 **18 Claims**

1. A food coating composition for imparting a crisp, golden-brown surface to foodstuff cooked in a microwave appliance comprising: a blend of bread crumbs and oil wherein the amount of bread crumbs in the blend ranges from 66 to 76% by weight of the blend and the amount of oil in the blend ranges from 24 to 34% by weight of the blend; and the amount of bread crumb/oil blend in the composition ranges from 40 to 90% by weight; dextrin in amounts ranging from 5 to 20% by weight of the composition; pre-gelatinized starch in amounts ranging from 5 to 20% by weight of the composition; and soy protein concentrate in amounts ranging from 2 to 20% by weight of the composition, said composition having a total oil content ranging from 15 to 24% by weight.

4,640,838

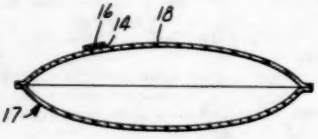
SELF-VENTING VAPOR-TIGHT MICROWAVE OVEN PACKAGE

Gary A. Isakson, Woodbury, Minn., and Curtis L. Larson, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 6, 1984, Ser. No. 647,882

Int. Cl.[4] B65D *51/16, 81/34;* H05D *9/00*

U.S. Cl. 426—107 **17 Claims**



1. A vapor-tight package including means for automatically venting through the package upon heating in a microwave oven, wherein the package comprises a sheet of thermoplastic film and a deposit of less extent than the film adhered to said sheet at the point where venting is desired to occur and comprising nonmetallic, microwave-absorbing particles selected from the group consisting of graphite and carbon black dispersed in a nonmetallic binder, which deposit has a thickness within the range from 10 to 300 micrometers, said particles comprising at least 10% by weight of said deposit, the dimensions of the deposit and the concentration of the particles being sufficient to provide sufficient heating of the thermoplastic film when exposed to microwave energy to cause softening of the film sufficient to cause or allow rupture and venting of the package through the softened ruptured film without arcing.

4,640,839

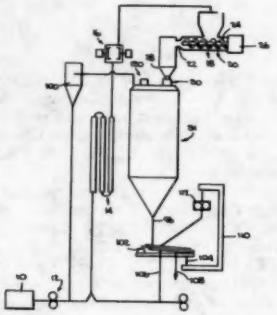
AGGLOMERATION PROCESS

Sheng-Hsiung Hsu, Marysville, Ohio, assignor to Nestec S.A., Vevey, Switzerland

Filed Jul. 1, 1985, Ser. No. 750,931

Int. Cl.[4] A23F *5/38, 5/44;* A23C *9/16;* A23G *1/00*

U.S. Cl. 426—285 **18 Claims**



1. A process agglomerating a water-soluble particulate material comprising:

(a) projecting a stream of particles of the particulate material through a confined moistening chamber in a downward direction along a generally vertical path, the stream of particles having a lesser cross-section width than the cross-section width of the moistening chamber;

(b) diffusing an aqueous gas horizontally inwardly, from outside and about the periphery of the confines of the moistening chamber, towards the stream of particles such that the aqueous gas is directed to and surrounds and tends to confine the stream of particles under relatively quiescent conditions throughout their path through the moistening chamber to moisten and fuse the particles; and then

(c) drying the resulting moistened and fused particulate material.

4,640,840

FOOD PROCESSING METHOD TO AVOID NON-ENZYMATIC BROWNING

Ivar Assinder, Kempston, England; Michael K. Supran, River Vale, N.J., and Geoffrey A. K. Thompson, Great Barford, England, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed May 7, 1985, Ser. No. 731,572

Claims priority, application United Kingdom, May 8, 1984, 8411720

Int. Cl.[4] A23L *1/00*

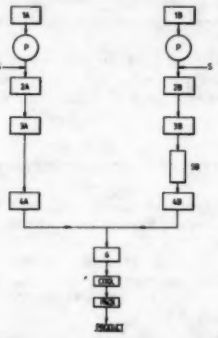
U.S. Cl. 426—399 **8 Claims**

1. A method for minimizing non-enzymatic browning reactions during heat-processing of liquid foodstuffs having carbohydrate and nitrogenous reactants, comprising the steps of:

(a) aseptically heat-processing the carbohydrate components of the liquid foodstuff comprising reducing sugars, aldehydes, ketones, and mixtures thereof;

(b) aseptically heat-processing the nitrogenous components

of the liquid foodstuff comprising proteins and amino acids; and



(c) combining the aseptically heat-processed components of the liquid foodstuff sub (a) and sub (b) at a temperature of at most 65° C.

4,640,841

PROCESS FOR THE EXTRACTION OF HOP SUBSTANCES

Adrian Forster, and Manfred Gehrig, both of Wolnzach, Fed. Rep. of Germany, assignors to Hopfenextraktion HVG Barth, Raiser & Co., Wolnzach, Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 683,436

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346776

Int. Cl.⁴ A23L *1/211*

U.S. Cl. 426—425 **6 Claims**

1. A process for obtaining extracts from hops by extraction of hop containing material selected from the group consisting of hops, hop powder and hop pellets by treatment thereof with supercritical carbon dioxide solvent in the absence of organic solvents under pressures of between about 100 and about 300 bar comprising the sequential steps of carrying out the extraction step at a temperature of between about 110° and about 150° C. but below the boiling point of said solvent at the aforesaid pressures, and removing said extracts from said solvent.

4,640,842

INTERNALLY FLAVORED HULLED CEREAL GRAIN AND PROCESS FOR PREPARATION

William A. May, 5 House Wren, Hackettstown, N.J. 07840

Continuation-in-part of Ser. No. 697,204, Feb. 1, 1985, which is a continuation-in-part of Ser. No. 547,131, Oct. 31, 1983, abandoned, and a continuation-in-part of Ser. No. 577,342, Feb. 6, 1984, abandoned, and a continuation-in-part of Ser. No. 605,466, Apr. 30, 1984, abandoned. This application Aug. 13, 1985, Ser. No. 764,711

Int. Cl.⁴ A23L *1/00, 1/18*

U.S. Cl. 426—534 **33 Claims**

1. A process for introducing an organic flavorant into hulled cereal grain comprising the steps of contacting such grain with said flavorant under aqueous liquid phase conditions while maintaining said liquid phase at a temperature in the range from about 60° to 200° F. for a time at least sufficient to introduce into the endosperm of such hulled cereal grain at least an organoleptically detectable taste of said flavorant without substantial change in hull structure, said flavorant containing at least four carbon atoms per molecule, and, when said flavorant contains at least one carboxyl group per molecule, then said flavorant has a dissociation constant in water which is less than about 1×10^{-5} whereby, when such grain's hull is separated from such grain's germ and endosperm, the flavor associated with such flavorant material is organoleptically detectable in such germ and endosperm.

4,640,843

LOW FAT CONTENT FOOD CHIPS AND METHOD OF PREPARATION

Edward A. Matuszak, Liverpool; Yanien Lee, Manlius, and Stephen R. Gillmore, Weedsport, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Dec. 11, 1984, Ser. No. 680,350

Int. Cl.⁴ A23L *1/01*

U.S. Cl. 426—560 **20 Claims**

1. A process for preparing food product chips or ribbons comprising subjecting a comminuted starch-containing food composition having a moisture content of from about 30 percent by weight to about 40 percent by weight to compression at a pressure of at least 1000 psig and at a temperature of from 60° F. to about 110° F. and sequentially frying said composition in an edible oil without an intermediate drying step, whereby a substantial portion of said moisture content is retained during the period of compression and introduction of said starch-containing composition into said frying step.

4,640,844

METHOD FOR THE MANUFACTURE OF GATE ELECTRODES FORMED OF DOUBLE LAYERS OF METAL SILICIDES HAVING A HIGH MELTING POINT AND DOPED POLYCRYSTALLINE SILICON

Franz Neppl; Ulrich Schwabe, both of Munich, and Konrad Hieber, Bernau, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

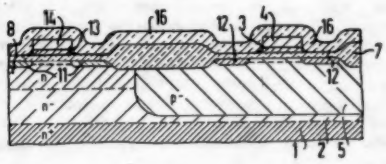
Filed Mar. 8, 1985, Ser. No. 709,712

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3419034

The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.⁴ B05D *5/12*; C23C *16/00*

U.S. Cl. 427—38 **10 Claims**



1. A method for manufacture of gate electrodes formed of double layers of metal silicides having a high melting point and doped polycrystalline silicon (polycide) for integrated complementary MOS-field effect transistor circuits (CMOS) in which manufacture of source and drain zones is carried out through ion implantation in n-type and p-type zones in a substrate with a field oxide zone thereover after production of a gate electrode through use of the gate electrode as an implementation mask, comprising the steps of:

(a) depositing a layer formed of undoped polycrystalline silicon on the gate oxide layer lying over the n- and p-type zones in the substrate;

(b) applying a metal silicide layer on the undoped polycrystalline silicon layer so as to create a polycide double layer;

(c) structuring the polycide double layer so as to create respective gates above the n- and p-type zones;

(d) implanting source and drain zones of one transistor conductivity type with a respective dopant while masking zones of the opposite transistor conductivity type and vice versa, and wherein during the implanting, the respective structured metal silicide layers are also correspondingly doped with respective dopants; and

(e) removing the masks, depositing an intermediate oxide through a temperature treatment, and then diffusing said respective dopants introduced into said respective structured metal silicide layers from the respective metal silicide layers into the respective structured polycrystalline silicon layers lying therebeneath.

4,640,845

METHOD AND APPARATUS FOR FORMING NON-SINGLE-CRYSTAL LAYER

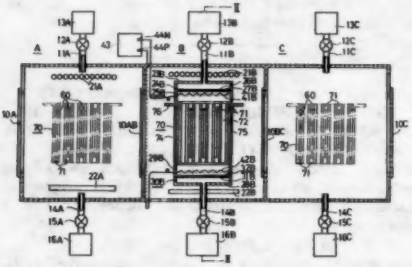
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 533,941, Sep. 20, 1983, Pat. No. 4,582,720. This application Feb. 13, 1986, Ser. No. 828,790

Claims priority, application Japan, Sep. 20, 1982, 57-163728; Sep. 20, 1982, 57-163729; Sep. 25, 1982, 57-167280; Sep. 25, 1982, 57-167281

Int. Cl.[4] C23C *16/50*

U.S. Cl. 427—38 **21 Claims**



1. A non-sinle-crystal layer forming method in which a material gas for forming a non-single-crystal layer is introduced into a reaction cahamber and is excited to form the non-single-crystal alyer by deposition on one or more substrates placed in the reaction chamber, wherein the material gas is confined within a region within the reaction chamber, said region being defined by first and second cup-shaped gas guide members and a tubular holder for at least one substrate wherein the material gas is guided by said first and second cup-shaped gas guide members provided upstream and downstream of said tubular substrate holder, respectively, so that the material gas stream is confined to said region to pass along the substrate surfaces.

4,640,846

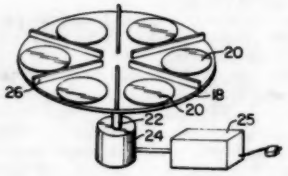
SEMICONDUCTOR SPIN COATING METHOD

Yue Kuo, 1079 San Pablo Ave. #8, Albany, Calif. 94706

Filed Sep. 25, 1984, Ser. No. 654,441

Int. Cl.[4] B05D *5/12*; **H01L** *21/312*

U.S. Cl. 427—82 **12 Claims**



1. A method for coating semiconductor wafers with a liquid film comprising:

first, depositing a continuous non-uniform layer of the liquid film on the top of the wafers;

second, rotating the wafers about an axis perpendicular to the plane of the wafers and removed from the wafers to spread said film substantially uniformly across said wafers; and

third, preventing liquid film deposited on one wafer from contacting another wafer during said rotation without reflecting said liquid film back onto said first wafer.

4,640,847

PARTIALLY PRESSURE-SENSITIVE RECORDING PAPER

Yoshio Okada, and Yuriko Igarashi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1985, Ser. No. 690,523

Claims priority, application Japan, Jan. 17, 1984, 59-4776

Int. Cl.[4] B41M *5/16*

U.S. Cl. 427—150 **3 Claims**

1. A process for producing a partially pressure-sensitive recording paper comprising dispersing dried microcapsules containing a solution of a colour-former into an organic solvent selected from the group consisting of hexane, cyclohexane, heptane, octane, nonane, toluene, xylene, ethanol, propanol, isopropyl alcohol, butanol, ethyl butyl ether and dibutyl ether, further dispersing the thus prepared dispersion into a thermally melting suspension medium selected from the group consisting of Japan tallow (haze wax), Carnauba wax, Montan wax, paraffin wax, microcrystalline wax, polyethylene wax, oxidized wax and mixtures thereof, thereby obtaining an ink comprising said microcapsules, said thermally melting suspension medium and said organic solvent, and painting the thus obtained ink on a specified part of a surface of a sheet of paper, said thermally melting suspension medium being in the range of 30 to 200 parts by weight to 100 parts by weight of said microcapsules, and said dried microcapsules being obtained by dispersing, as a core substance, said solution of a colour-former in an aqueous medium containing at least one prepolymer selected from the group consisting of melamine-formaldehyde prepolymers, urea-formaldehyde prepolymers, melamine-urea-formaldehyde prepolymers, melamine-thiourea-formaldehyde prepolymers and melamine-thiourea-urea-formaldehyde prepolymers or a mixture of a melamine-formaldehyde prepolymer and a thiourea-formaldehyde prepolymer, a water-soluble cationic urea resin and a low molecular weight anionic surfactant, polycondensing said water-soluble cationic urea resin and said prepolymer on the surface of the thus dispersed solvent droplets containing said colour-former by adding an acid-catalyst, while causing complex-coacervation between said water-soluble cationic urea resin and said anionic surfactant, and drying the microcapsules separated from the aqueous dispersion.

4,640,848

SPRAY-APPLIED CERAMIC FIBER INSULATION

Juan M. Cerdan-Diaz, North Tonawanda, N.Y.; Michael J. Sanders, Salsbury, N.C., and Mark E. Wellar, Niagara Falls, N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Aug. 26, 1985, Ser. No. 770,333

Int. Cl.[4] B05D *1/34*

U.S. Cl. 427—426 **21 Claims**

1. A spray-applied refractory fiber thermally insulating layer comprising on a dry weight basis:

(a) from about 72.5 to about 97.5 weight percent ceramic fiber;

(b) an organic binder component in amount sufficient to impart a wet adhesion to steel of at least 0.2 g/cm^2; and

(c) an inorganic binder component in amount from about 2.5 to about 30 weight percent based on weight of fiber of solids derived from a colloidal sol of a high temperature resistant refractory metal oxide.

13. A method of forming a thermally insulating layer on a substrate comprising:

(a) providing ceramic fibers;

(b) providing a binder including:

(i) an organic polymeric binder component;

(ii) an inorganic binder component in the form of a sol of a high temperature refractory metal oxide;

(iii) a liquid vehicle which is a solvent for the organic component and a diluent for the inorganic component;

(c) Applying said sol and liquid vehicle to said ceramic fibers while spraying said fibers toward the substrate.

4,640,849

META-BRIDGED STYRYLOXY RESINS

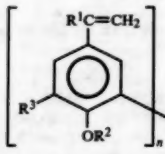
John G. Woods, Dublin, and John M. Rooney, Kildare, both of Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jan. 31, 1986, Ser. No. 824,903

Int. Cl.[4] B05D *3/06;* **C08F** *283/04, 26/02;* **C08G** *18/08;* **C07C** *125/06*

U.S. Cl. 427—54.1 **20 Claims**

17. A method of curing a compound to a cross-linked solid, the compound having the formula:



where R^1 is H or methyl; R^2 is hydrocarbyl, hydrocarbyl interrupted by oxygen atoms, or halo substituted hydrocarbyl; R^3 is H, lower alkyl, or alkoxy; G is any multivalent organic or inorganic radical free of amino or aliphatic thiol groups; and n is an integer of 7.

18. A method as in claim 17 for providing a colored cross-linked coating on a substrate, the method further comprising coating said substrate with said composition prior to cationically polymerizing the composition.

19. The method of claim 18 wherein said composition further comprises a cationic photoinitiator and said cationically polymerizing step comprises irradiating said composition coated substrate with UV irradiation.

4,640,850

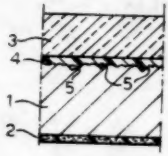
COMPOSITE SLAB INCORPORATING A SHEET OF MARBLE OR SIMILAR NATURAL STONE, FOR THE FORMATION OF FACINGS FOR BUILDING, INTERIOR DECORATION AND THE LIKE

Giuseppe Marocco, Turin, Italy, assignor to Technomarmi Maiera S.p.A. and Seifag S.r.l., both of, Italy

Division of Ser. No. 486,172, Apr. 18, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 679,089

Int. Cl.[4] B05D *5/00;* **B44F** *9/04*

U.S. Cl. 428—15 **3 Claims**



1. A composite slab for exterior facings on a building, interior decoration and the like comprising a thin sheet of natural stone having at least one rough unfinished face intended to be visible in use, a protective sheet of transparent glass overlying said rough unfinished face and a layer of transparent thermoplastics material interposed between said sheets and adhered to both sheets for connecting said sheets to define a composite slab wherein the thermoplastics material completely fills any surface defects in the rough unfinished face of said stone sheet so as to provide a smooth finished appearance to said surface of said stone sheet when viewed through said glass sheet and said layer of thermoplastics material while providing protection for said stone sheet against corrosion.

4,640,851

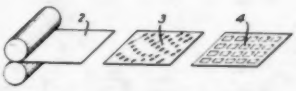
BROAD BAND CAMOUFLAGE SCREEN HAVING A FREQUENCY DEPENDENT RADAR ATTENUATION

Gunter Pusch, Bannholzweg 12, 6903 Neckargemund 2, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,080

Int. Cl.[4] F41H *3/00, 3/02;* **B32B** *3/10*

U.S. Cl. 428—17 **9 Claims**



1. A camouflage material having a wide-band effect ranging from the visual portion of the spectrum up through the radar region of the spectrum, said material comprising at least a base layer, an intermediate homogeneous metal layer on said base layer reflective in the range of terrestrial thermal radiation as well as in the radar region of the spectrum and having a specific surface resistivity of not more than 0.5 to 10 ohms per square and an outer camouflage paint layer applied on said reflective metal layer, said paint containing coloring matter having reflective properties in the visible and near IR spectral regions that are similar to the natural background and containing a binder having high transparency characteristics in the spectral regions of the atmospheric windows II (3–5 μm) and III (8–14 μm) and wherein the emissivity of the camouflage paint in windows II and III varies over the surface of the material and varies between 50 and 90% in window II and between 60 and 95% in window III and wherein the metal is selected from the group consisting of aluminum, copper, zinc and its alloys and is deposited in a pattern of rectangles or squares whose long dimension is smaller than ½ lambda of the largest radar wavelength used for reconnaissance systems and larger than ½ lambda of the radar wavelength used for homing missiles and bullets.

4,640,852

MULTIPLE LAYER FILMS CONTAINING ORIENTED LAYERS OF NYLON AND ETHYLENE VINYL ALCOHOL COPOLYMER

William F. Ossian, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 28, 1984, Ser. No. 675,519

Int. Cl.[4] B65D *30/02;* **B32B** *27/08*

U.S. Cl. 428—35 **15 Claims**

1. A multiple layer oriented sheet structure wherein the layers are firmly adhered to each other, said sheet structure comprising a first oriented layer of nylon, and in face to face contact with said first layer, a second oriented layer of ethylene vinyl alcohol copolymer, said second layer containing an effective amount of a plasticizer therefore, said sheet structure

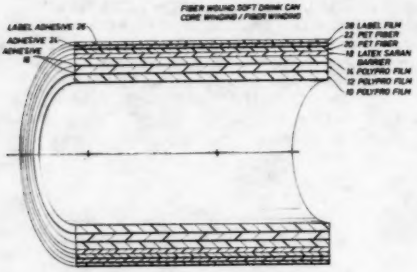
being capable of withstanding retort conditions for 30 minutes at 250° F. without substantial embrittlement of said layers.

4,640,853

FIBER WOUND PLASTIC BEVERAGE CAN

W. R. Schmeal; S. N. Singhal, and K. H. Lo, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 12, 1985, Ser. No. 764,690
Int. Cl.[4] B65D *8/08*; D02G *3/00*
U.S. Cl. 428—35 10 Claims



1. A beverage can which will withstand pressure from carbonated beverages and which has acceptable swelling resistance, which comprises:

a thermoplastic core;

at least two fiber layers wound on said thermoplastic core;

adhesive layer between said fiber layers and said core and between said fiber layers themselves where said fiber layers are made of multiple fibers in an ordered relation; and

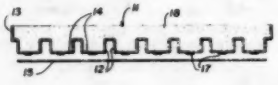
a barrier layer contiguous to either said thermoplastic core or said fiber layers or within said thermoplastic core or said fiber layers.

4,640,854

SELF-SUPPORTING COMPOSITE PLATE, ESPECIALLY FOR DOUBLE FLOORS

Manfred Radtke, Margetshöchheim, Fed. Rep. of Germany, assignor to MERO-Werke Dr.-Ing Max Mengeringhausen GmbH & Co., Wurzburg, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,716
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431118
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—35 10 Claims



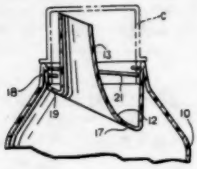
1. Self-supporting composite plate, for double floors or the like, with a pan-shaped outside wrapper for flowable and hardenable filler material with high compression resistance when in hardened state, e.g. anhydrite, concrete or the like, characterized in that the pan-shaped wrapper (11) is provided on the bottom thereof with a plurality of burl-like projecting blocks (12) containing filler material (18), and a base element (15) of high tensile strength is connected to said projecting blocks, said base element (15) being a thin sheet metal plate and being welded to the bottoms of the projecting blocks (12) to absorb tensile stresses thereon.

4,640,855

PLASTIC CONTAINER WITH INTEGRAL SPOUT

David L. St. Clair, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 25, 1985, Ser. No. 791,287
Int. Cl.[4] B67D *1/16*
U.S. Cl. 428—36 6 Claims



1. A plastic container comprising

a hollow plastic body,

an integral tubular neck extending from said body,

said neck having an integral outer wall and an integral inner wall connected to the outer wall,

and an integral spout integrally connected to the lower edge of the inner wall and defining a dispensing opening and extending outwardly from the hollow body.

4,640,856

MULTI-LAYER PACKAGING FILM AND RECEPTACLES MADE THEREFROM

Daniel J. Ferguson; Henry G. Schirmer, both of Spartanburg, and Walter B. Mueller, Inman, all of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Apr. 29, 1985, Ser. No. 728,428
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—36 18 Claims

1. A multi-layer, thermoplastic barrier film having at least three layers comprising:

(a) a layer consisting essentially of very low density polyethylene having a density of less than 0.910 gms/cc;

(b) a barrier layer comprising a material selected from the group consisting of: (1) copolymers of vinylidene chloride and (2) hydrolyzed ethylene-vinyl acetate copolymers;

(c) a thermoplastic polymeric layer, said layer being on the side of the barrier layer opposite to that of layer (a); and,

(d) the shrinkage of layer (a) controlling the shrinkage of the entire multi-layer barrier film, said multi-layer film having been oriented and rendered heat shrinkable at a temperature below 100° C. (212° F.), said orientation temperature being about 40° F. or more below the melt temperature of said very low density polyethylene.

4,640,857

PLYWOOD

Katsuji Hasegawa, Obbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Jan. 25, 1983, Ser. No. 460,774
Claims priority, application Japan, Jan. 30, 1982, 57-13600
Int. Cl.[4] B32B *21/14*
U.S. Cl. 428—57 5 Claims

1. Plywood comprising at least two standard sections each having multiple straight extending plies of veneer sheets glued together and at least one joint section wherein two contiguous ends of two adjacent veneer sheets forming the external opposite faces of said plywood are glued together lapping one on

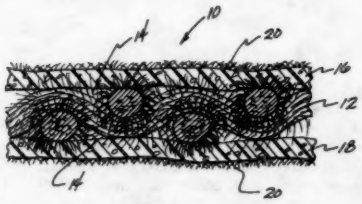
the other, at least one end of said two contiguous ends being beveled and the lapping distance being greater than the beveled distance, no veneer sheet extending and interposed between said veneer sheets forming said external opposite faces at said standard sections being present substantially over the distance of said joint section, so that the thickness of the joint sectionis made substantially equal to that of the standard sections.

4,640,858

SYNTHETIC LEATHER SHEET MATERIAL PRODUCTS

Gary A. Barnett, Wellford, S.C., assignor to M. Lowenstein Corporation, Lyman, S.C.

Filed Oct. 29, 1984, Ser. No. 666,272
Int. Cl.[4] B32B *7/08, 3/00*
U.S. Cl. 428—90 **7 Claims**



1. A composite sheet material having a soft suede-like surface appearance and feel, high liquid absorption and retention, and improved resilience and abrasion resistance comprising a reinforcing textile fabric substrate having opposed raised fiber surfaces; a water-absorbent, porous polymeric foam layer secured to each of the raised fiber surfaces of the fabric with the fibers substantially embedded therein, each of said polymeric foam layers comprising a composition containing as ingredients therein a hydrophillic acrylonitrile-butadiene polymer and a polyacrylate polymer, said acrylonitrile-butadiene copolymer being present in said composition in an amount of between about four to fifteen parts per one part of said polyacrylate polymer, by weight; and a plurality of flocked fibers embedded in and extending from the outer surface of each foam layer, said fibers having a length of from about 0.75 to 1.25 mm and providing with said water-absorbent porous polymeric foam layers an improved liquid absorption of the sheet material and reduced surface tack, and the outer flocked fibrous surfaces of the polymeric foam layers being further characterized by the absence of any water-insoluble, film-forming resinous coating thereon.

4,640,859

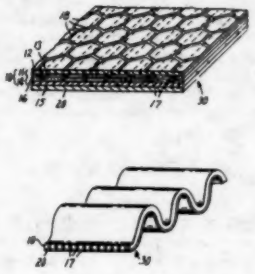
INELASTIC, HEAT-ELASTICIZABLE SHEET MATERIAL FOR DIAPERS

Paul E. Hansen, Lake Elmo, and Susan K. Marquardt, Little Canada, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 565,451, Dec. 27, 1983, Pat. No. 4,552,795.
This application Sep. 23, 1985, Ser. No. 778,851
Int. Cl.[4] B32B *5/12;* A61F *13/16*
U.S. Cl. 428—105 **1 Claim**

1. A laminate comprising a disposable diaper to which is attached a substantially inelastic, flexible composite flat sheet material that is dimensionally stable at room temperature, said sheet material comprising in combination:

a plurality of parallel elastomeric strands extended to several times their relaxed length and bonded to at least one substantially flat inelastic planar web other than the diaper by thermoplastic, substantially inelastic polymeric binder, the stiffness of the combined web and binder decreasing significantly when heated, thereby permitting the elastomeric strands to contract and the laminate to shirr at right angles to the length of the elastomeric strands.

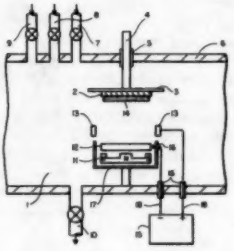


4,640,860

OPTICAL RECORDING COATING

Ian T. Ritchie, Santa Monica, Calif., assignor to Andus Corp., Canoga Park, Calif.

Filed Oct. 16, 1985, Ser. No. 787,862
Int. Cl.[4] D06N *7/04;* G01D *9/00*
U.S. Cl. 428—143 **32 Claims**



1. An optical recording coating for recording data, comprising:

a cermet optical storage layer disposed on a substrate, the layer comprising metal particles dispersed in a solid dielectric matrix, the metal particles comprising a first material selected from the group consisting of gold, silver, nickel, copper, platinum, palladium, rhodium and combinations thereof, the dielectric comprising a second material selected from the group consisting of SiO_2, SnO_2, In_2O_3, GeO_2, TiO_2, Ta_2O_5, ZnO, ZrO_2, Y_2O_3, CdO, Si_3N_4, TiN and other transition metal nitrides and combinations thereof, the layer being constructed and dimensioned such that its reflectance towards a fixed point substantially changes subsequent to being illuminated by high powered light such that information can be stored in the layer by selectively illuminating the layer with the high powered light, the layer being selectively illuminated with the high powered light.

24. A method of optimizing properties of an optical storage layer for storing information by being selectively illuminated with high powered light, comprising the steps of:

varying a thickness of the optical storage layer and varying a metal particle atomic fraction as well as a solid dielectric atomic fraction of the optical storage layer so as to optimize an optical reflectance, an optical absorptance, and a thermoconductivity of the optical storage layer so as to be suitable for recording information by being selectively

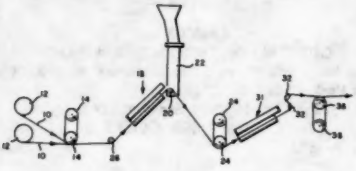
illuminated with high power light, the optical storage layer comprising a cermet optical storage layer, the cermet comprising metal particles dispersed in a ceramic matrix, the metal particles comprising a first material selected from the group consisting of gold, silver, nickel, copper, platinum, palladium, rhodium and combinations thereof, the ceramic matrix comprising a second material selected from the group consisting of SiO_2, SnO_2, In_2O_3, GeO_2, TiO_2, Ta_2O_5, ZnO, ZrO_2, Y_2O_3, CdO, Si_3N_4, TiN and other transition metal nitrides and combinations thereof.

4,640,861

FIBER REINFORCED THERMOPLASTIC MATERIAL

Edwin K. Binnersley, and William H. Krueger, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 7, 1984, Ser. No. 618,112
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—294 **5 Claims**



1. A fiber reinforced thermoplastic material comprising: an array of synthetic fiber bundles comprised of continuous filaments and a thermoplastic polymer coating substantially all sides of the filaments in the array to form a composite, said fiber bundles comprising from 50 to 60 percent by volume of said composite the uniformity of distribution of said filaments in said composite as measured by the ratio of the mass mean length (L) between fiber bundles in the composite consolidation direction to the mass mean length between fiber bundles in the direction perpendicular thereto, said ratio being from about 0.5 to 1.0.

4,640,862

COATED, HEAT SHRINKABLE EXPANDED POLYSTYRENE

Sherman Lakes, Lexington, Ky., assignor to Day Star Concepts, Lexington, Ky.

Division of Ser. No. 479,018, Mar. 25, 1983, Pat. No. 4,546,134. This application Feb. 12, 1985, Ser. No. 700,623
Int. Cl.[4] B32B *5/14*; B05D *3/02*; E04C *1/00*
U.S. Cl. 428—308.4 **11 Claims**

1. An expanded polystyrene dropout ceiling tile having a surface coated by applying to said surface an aqueous coating composition comprising:

from about 35% to about 55% of a water soluble salt of a polymer of acrylic acid as a film forming component;

from about 15% to about 40% of a plasticizing component;

from about 20% to about 40% of a dispersing agent; and a pigment;

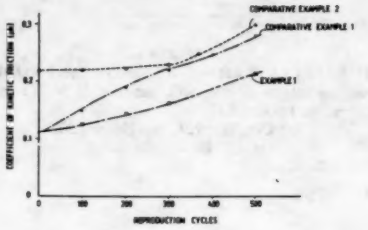
wherein the percentages of film forming component, plasticizing component and dispersing agent are weight percentages based on the combined total actives in the film forming component, plasticizing component and dispersing agent and wherein said film forming component is present in an amount effective to bind said dispersing agent and said pigment to said surface but ineffective to alter to the heat shrink characteristics of such tile at 550° C.

4,640,863

MAGNETIC RECORDING MEDIA

Yukio Matsumoto, and Masaru Hanayama, both of Mito, Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Apr. 27, 1984, Ser. No. 605,673
Claims priority, application Japan, Apr. 30, 1983, 58-77124
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 **3 Claims**



1. A magnetic recording medium which comprises a flexible support and a magnetic layer formed on the flexible support, the flexible support being made of a resin composition which comprises a thermoplastic resin and particles selected from the group consisting of titanium monoxide and dititanium trioxide dispersed in the thermoplastic resin in an amount of 0.03 to 10 wt% of the composition, said particles having an average size below 2.5 μm.

4,640,864

FACING FOR PLASTIC FOAMED CONSTRUCTION INSULATION BOARD

John F. Porter, St. Catharines, Canada, assignor to Bay Mills Limited, St. Catharines, Canada

Filed May 4, 1984, Ser. No. 607,287
Int. Cl.[4] B32B *23/04, 17/10*
U.S. Cl. 428—334 **13 Claims**

1. A plastic foamed construction insulation board facing that is flexible, thin, and light weight and capable of use in manufacturing such board in which the plastic foam is formed on the facing during manufacture of the board consisting essentially of,

(a) paper, said paper having a basis weight of from about 10 pounds to about 20 pounds and having been treated with a treatment comprising materials whose dry weight is about 10% to 100% of the weight of the paper and which treatment coats fibers in said paper with a composition which provides means for reducing the liquid permeability of fibers of said paper, filling interstices in said paper, and imparting to the paper fire retardancy, water repellancy, reduced porosity, and reduced ability to transmit liquids through said paper,

(b) and a reinforcing scrim adhesively bonded to said paper.

4,640,865

BARRIER FILM STRUCTURES

Gerald M. Lancaster, Surfside; David C. Kelley, Angleton; Russell H. Cramm, Lake Jackson, all of Tex., and Charles V. Neywick, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 645,990, Aug. 31, 1984, which is a continuation-in-part of Ser. No. 531,110, Sep. 12, 1983. This application May 28, 1985, Ser. No. 738,009
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—421 **14 Claims**

1. An article comprising a carbon monoxide-containing polymer having coated thereon, as an adhering layer, a halopolymer,

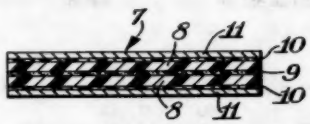
wherein said halopolymer layer is one which has been applied to the carbon monoxide-containing polymer as a fine particle aqueous dispersion or latex and dried.

4,640,866

PRINTED CIRCUIT BOARD

Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Company Ltd., Tokyo, Japan

Filed Apr. 1, 1985, Ser. No. 718,802
Claims priority, application Japan, Apr. 10, 1984, 59-72472
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—422 3 Claims



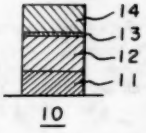
1. A printed circuit board comprising a composite center layer of two layers of solid, sintered, nonporous polytetrafluoroethylene (PTFE) with a central layer of porous, expanded PTFE sandwiched therebetween, each of said solid PTFE layers having a metallic layer bonded to its outer surface by a bonding agent selected from the class consisting of a perfluoroalkylether copolymer (PFA) and tetrafluoroethylene-hexafluoropropylene copolymer (FEP).

4,640,867

OPTICAL ARTICLE HAVING IMPROVED HEAT RESISTANCE

Takuji Oyama, and Mamoru Mizuhashi, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,137
Claims priority, application Japan, May 29, 1984, 59-107619
Int. Cl.[4] B32B 15/00, 17/06, 9/00, 15/04
U.S. Cl. 428—432 12 Claims



1. An optical article having improved heat resistance, which comprises a substrate and at least one laminated coating formed on the substrate, the laminated coating comprising (A) a highly expansive layer having a high thermal expansion coefficient and (B) a less expansive layer having a thermal expansion coefficient lower than that of the highly expansive layer, wherein the improvement is characterized in that a Ti coating layer or a Cr coating layer is interposed at the interface between the highly expansive layer and the less expansive layer, wherein the said Ti coating layer or the said Cr coating layer is (1) made of Ti metal or Cr metal, or (2) a Ti metal alloy or a Cr metal alloy containing Ti or Cr in an amount of at least 50%, respectively, and wherein the said highly expansive layer is made of a fluoride such as MgF_2, CeF_3, Na_3AlF_6, LaF_3 or a mixture thereof, and the said less expansive layer being made of an oxide such as ZrO_2, TiO_2, Al_2O_3, SiO_2, Y_2O_3, Ta_2O_5, or a mixture thereof.

4,640,868

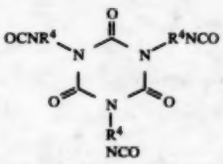
CLEAR, WEATHER RESISTANT ADHERENT COATING

Howard I. Penn, Skokie, Ill., assignor to Morton Thiokol Inc., Chicago, Ill.

Filed Feb. 10, 1986, Ser. No. 828,468
Int. Cl.[4] B32B 9/04
U.S. Cl. 428—446 20 Claims

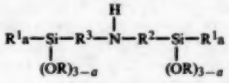
1. A composition, upon hydrolysis and curing, providing a protective coating comprising the reaction product of:

(a) an isocyanurate polyisocyanate having the following formula:



wherein R_4 is a substituted or unsubstituted aliphatic or cycloaliphatic group having from 1 to 12 carbon atoms or an aryl group, and

(b) an amino disilane having the formula:



wherein R is a lower alkyl having 1 to about 6 carbon atoms; R^1 is a lower alkyl having 1 to about 4 carbon atoms; R^2 and R^3, which may be the same or different, are each substituted or unsubstituted alkylene radicals having 2 to 18 carbon atoms or arylene radicals having 6 to 18 carbon atoms; and a is an integer having values of 0 to 2.

4,640,869

HARD METAL WATCH CASE WITH A RESISTANT COATING

Eric Loth, Bienne, Switzerland, assignor to Montres RADO SA, Lengnau, Switzerland

Filed May 7, 1985, Ser. No. 731,222
Claims priority, application Switzerland, Jun. 7, 1984, 2781/84
Int. Cl.[4] B32B 9/00, 15/04
U.S. Cl. 428—469 5 Claims

1. A watch case comprising a case body overlaid by a coating, the hardness of the body being greater than 600 HV_1, the coating comprising a first layer obtained by the combination of a metal and an element whose atomic number is less than 9 applied to said body by chemical vapor deposition (CVD) and a second layer having the same composition as the first layer applied onto said first layer by physical vapor deposition (PVD).

4,640,870

LAMINATE STRUCTURE AND PRODUCTION OF THE SAME

Toshiyuki Akazawa; Yoshinari Tanaka, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 30, 1985, Ser. No. 728,747
Claims priority, application Japan, May 9, 1984, 59-93556
Int. Cl.[4] B32B 27/06
U.S. Cl. 428—483 2 Claims

1. A laminate structure comprising (a) a layer of a saponified product of an ethylene-vinyl acetate copolymer containing 20 to 55 mole % of ethylene and having a degree of saponification of at least 90 mole % and (B) a layer of hydrophobic thermo-

plastic resin, with (C) a bonding interlayer placed therebetween which comprises a composition of (X) a polymer of ethylene, an acrylic acid ester, and an ethylenically unsaturated carboxylic acid or anhydride thereof and (Y) a polymer of ethylene and an acrylic acid ester, said polymers (X) and (Y) being formulated so that the following formulas (I), (II), (III), and (IV) are satisfied:

$$|Vx - Vy| \leq 0.15 \quad \text{(I)}$$

$$0.10 \leq Vx \cdot Wx + Vy \cdot Wy \leq 0.45 \quad \text{(II)}$$

$$0.03 \leq Cx \cdot Wx \leq 1 \quad \text{(III)}$$

$$0.05 \leq Wx/Wy \leq 10 \quad \text{(IV)}$$

where:

Vx: content (in weight fraction) of acrylic acid ester in polymer (X)

Vy: content (in weight fraction) of acrylic acid ester in polymer (Y),

Cx: content (in meq/g) of carboxyl group of ethylenically unsaturated carboxylic acid or anhydride thereof in polymer (X),

Wx: quantity (in weight fraction) of polymer (X), and

Wy: quantity (in weight fraction) of polymer (Y).

4,640,871

MAGNETIC MATERIAL HAVING HIGH PERMEABILITY IN THE HIGH FREQUENCY RANGE

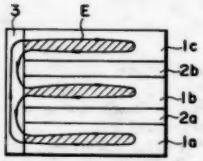
Kazuhiko Hayashi; Yoshitaka Ochiai; Masatoshi Hayakawa; Hideki Matsuda; Wataru Ishikawa; You Iwasaki, and Koichi Aso, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 6, 1985, Ser. No. 773,019

Claims priority, application Japan, Sep. 12, 1984, 59-190973

Int. Cl.[4] B32B *15/04*; G11B *5/147*

U.S. Cl. 428—611 **3 Claims**



1. A magnetic structure having improved permeability characteristics at high frequencies comprising:

a plurality of magnetic metal layers,

an electrically insulating layer interposed between successive magnetic metal layers to form a laminate therewith, and

a plurality of electrical conductive strips each electrically connecting together at least two of said magnetic metal layers, said strips each having a width less than the width of the surface on which they are located, and being electrically isolated from each other.

4,640,872

CORROSION-RESISTANT STEEL STRIP HAVING ZN-FE-P ALLOY ELECTROPLATED THEREON

Toshio Irie; Kazuaki Kyono; Hajime Kimura, and Shigeo Kurokawa, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

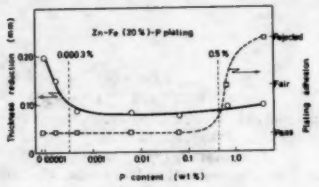
Continuation of Ser. No. 609,752, May 14, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 818,909

Claims priority, application Japan, May 14, 1983, 58-84584

Int. Cl.[4] B32B *15/01*

U.S. Cl. 428—659 **3 Claims**

1. A Zn-Fe-P electroplated steel strip having improved corrosion resistance with or without a paint coating and press workability for use in automobiles, said steel strip having a Zn-Fe-P ternary alloy electroplated on at least one surface



thereof, said alloy plating consisting essentially of 5% to 30% by weight of iron, 0.0003% to 0.5% by weight of phosphorus, and the balance of zinc based on the weight of the plating.

4,640,873

TEMPERATURE CONTROL SYSTEM FOR FUEL CELL POWERPLANT

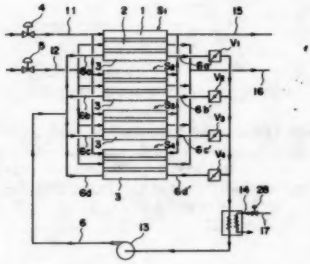
Osamu Tajima, Hirakata; Makoto Yamada, Katano; Hideo Hagino, Otsu, and Nobuyoshi Nishizawa, Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Mar. 18, 1986, Ser. No. 840,794

Claims priority, application Japan, Mar. 19, 1985, 60-55332

Int. Cl.[4] H01M *8/04*

U.S. Cl. 429—24 **3 Claims**



1. A temperature control system for a fuel cell powerplant of the kind wherein the powerplant comprises two or more fuel cell stacks and wherein cooling gas and process gases are separately fed to each fuel cell stack, that comprises

temperature detectors each being arranged in a fuel cell stack;

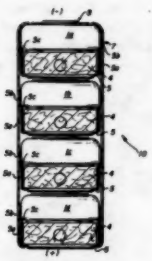
stack dampers each being arranged in each of inlet or outlet branched pipelines of a circulating pipeline for cooling gas, said circulating pipeline including a blower and an heat exchanger:

means for calculating the average value of operating temperatures of all the cell stacks detected by said temperature detectors, a difference between the average value and each detected temperature of the cell stacks, and a difference between the average value and a predetermined value of the operating temperature of the fuel cell stacks;

a driver for actuating each stack damper in response to the difference between the average value and the detected temperature of each cell stack,

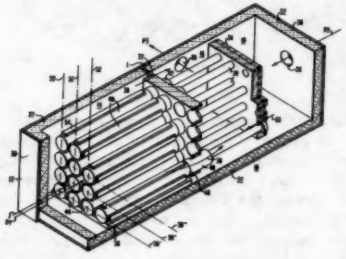
means for controlling the flow rate and/or the temperature of the cooling gas fed to the cell stacks in response to the difference between the average value and the predetermined value of the operating temperature of the cell stacks.

4,640,874
METAL/AIR CELL
Roger W. Kelm, New Richmond, Wis., assignor to Duracell Inc., Bethel, Conn.
Filed Jul. 29, 1985, Ser. No. 759,820
Int. Cl.[4] H01M *8/24, 12/04, 2/10*
U.S. Cl. 429—27 **14 Claims**



1. A metal/air cell comprising a metal anode, a catalytic air depolarizing cathode and a fluid electrolyte contained within a closed cylindrical cell container of a predetermined height, wherein said cell container is apertured in a position thereof adjacent said cathode to permit ambient air to enter said cell, characterized in that a cylindrical apertured cap is engagingly positioned on said cell container and covers the apertured portion thereof whereby the height of said cell is increased thereby to a required height and ambient air enters said cell through said cap.

4,640,875
FUEL CELL GENERATOR CONTAINING A GAS SEALING MEANS
Joseph M. Makiel, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 7, 1985, Ser. No. 699,118
Int. Cl.[4] H01M *8/10, 2/08*
U.S. Cl. 429—30 **19 Claims**



1. A high temperature solid electrolyte electrochemical generator comprising:

(A) an exterior housing;

(B) a gas permeable thermal insulation layer disposed next to and within the exterior housing;

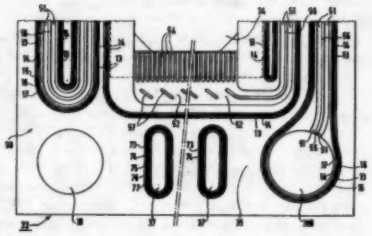
(C) an interior volume defined by the thermal insulation, said volume containing a fuel gas inlet generating chamber and a combustion product chamber containing combustion product outlet means, with a gas permeable partition dividing said fuel gas inlet generating chamber and combustion product chamber;

(D) a plurality of electrochemical cells, having solid electrolyte, disposed within the generating chamber;

(E) means for supplying fuel gas and oxidant gas to the electrochemical cells for reaction in the generating chamber, so that reacted fuel gas passes through the gas permeable partition; and

(F) seal means disposed through the thermal insulation and extending from the exterior housing to the gas permeable partition, so that reacted fuel gas cannot pass from the generating chamber into the combustion product chamber through the thermal insulation, but must pass through the gas permeable partition into the combustion product chamber.

4,640,876
FUEL CELL STRUCTURES
Bernard Warzawski, Paris, and Pierre Fauvel, Limours, both of France, assignors to Occidental Chemical Corp., Niagra Falls, N.Y.
Filed Jul. 8, 1985, Ser. No. 756,128
Claims priority, application France, Jul. 27, 1984, 84 12013
Int. Cl.[4] H01M *8/02*
U.S. Cl. 429—37 **10 Claims**



1. A fuel cell structure constituted by a plurality of identical juxtaposed cells which are disposed in electrical contact with one another and in which multiple cell forming frames are fixed together in a predetermined elementary frame sequence, the said cell structure including three distributions networks which are common to all of the cells, as follows:

an electrolyte distribution network for distributing electrolyte from an external source and including, in particular, a common inlet channel and a common outlet channel;

a fuel distribution network for distributing fuel from an external source and including, in particular, at least one fuel inlet channel and at least one outlet channel for removing unburnt fuel and inert gases from the cell structure; and

an oxidant distribution network including, in particular, a plurality of oxidant inlet and outlet orifices situated in the bottom and top faces of the cell structure;

each cell additionally comprising:

first and second porous electrodes which are preferably plane in shape with parallel faces, one being a cathode and the other an anode, and each including a specific catalyst;

an electrolyte filling the gap situated between the said electrodes; and

first and second impermeable bipolar current collectors comprising respective first and second frames of plastic material having at least one central conductive zone having channels on each of its faces, the first collector coming into electrical contact via the high points of its cathode face with the external surface of the said cathode, and via its anode face with the external surface of the anode of an adjacent cell, and the second collector coming into electrical contact via the high points of its anode face with the external surface of the said anode, and via its cathode face with the cathode of the other adjacent cell; the oxidizing gas from the said common oxidant distribution network flowing between the said cathode and the cathode face of the first collector and being supplied to the said cathode, and the fuel gas from the said common fuel distribution

network flowing between the said anode and the anode face of the second collector and being supplied to the said anode; the said first and second frames being provided with orifices to allow the electrolyte and the fuel to flow through the cell structure, the said orifices contributing by their juxtaposition to defining the said common inlet and outlet channels;

the said first electrode being applied against a third frame made of plastic material and having a central orifice in the form of a quadrilateral, the top and bottom portions of the third frame including orifices for conveying fuel and electrolyte through the cell structure, said orifices corresponding to the orifices provided in the frames of the collectors, and likewise contributing to the formation of the said inlet and outlet channels for the fuel and the electrolyte, means being provided on one face of the third frame to enable electrolyte to be conveyed from the inlet channel, to an electrolyte compartment situated between the two electrodes, and from the said compartment to an outlet channel, the said means including grooves that open out into set back portions that constitute electrolyte distributing and collecting manifolds disposed on the top and bottom portions of the third frame along two opposite sides of the central orifice and in communication with the electrolyte chamber by means of a plurality of parallel microchannels delimited by ribs,

the second electrode being applied against one of the faces of a fourth frame facing the said current collector, the said fourth frame being made of an insulating plastic material, and being of identical contour to the third frame against which the first electrode is applied having fuel and electrolyte conveying orifices corresponding to those provided in the said third frame, and being applied by a plane face against the face of the said third frame having the grooves and the electrolyte distributing and collecting manifolds,

the frames are fixed together in a predetermined elementary frame sequence to constitute a repetitive stack of cells and to define the said fuel distribution network, the said oxidant distribution network, and the said electrolyte distribution network;

the improvement wherein said frames are made of a molded, deformable material, and wherein at least the fuel and electrolyte distribution networks are surrounded, at least on one face of one of the frames constituting the said elementary frame sequence, by at least one rib integral with said frame, said at least one rib standing proud from said face, and the distance the said at least one rib projects from said face being sufficient to compensate for the statistical average of all the defects in evenness and parallelism of the totality of the frames defining said fuel cell structure, and with at least one groove integrally molded within one of said frames bearing said at least one rib and the frame facing said at least one rib, and said at least one groove lying adjacent to said at least one rib and extending parallel to the said at least one rib to receive excess material from the at least one rib when the cell structure components are fixed together.

4,640,877

PROCESS FOR THE OZONE PROTECTION BY PHOTOPOLYMER-FLEXOPRINTING PLATES BY ALCOHOL-SOLUBLE POLYAMIDES

Hans L. Schröder, Reinheim, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 26, 1985, Ser. No. 716,118

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415044

Int. Cl.⁴ G03F *7/02*; G03C *5/16*

U.S. Cl. 430—14 **12 Claims**

1. A process for the ozone protection of an imagewise exposed and developed photopolymer flexographic printing plate having an elastomeric polymeric binder which comprises

(a) applying to at least the exposed and developed surface of the flexographic printing plate a solution of an alcohol-soluble polyamide copolymer having a softening temperature above 120° C. in a solvent mixture consisting essentially of 10 to 90% by weight of n-propanol and 90 to 10% by weight of n-butanol, and

(b) drying the treated flexographic printing plate to remove the solvent mixture whereby a polyamide layer is formed on the surface of the flexographic printing plate.

12. An image bearing photopolymer flexographic printing plate having an elastomeric polymeric binder protected from ozone according to the process of claim 1.

4,640,878

METHOD OF FORMING A PRESSURE SENSITIVE IMAGE TRANSFER SHEET AND THE PRODUCT THEREOF

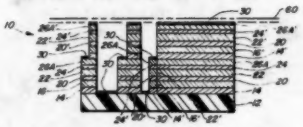
Robert Evans, and Robert Evans, Jr., both of Stamford, Conn., assignors to Identicolor International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 710,374, Mar. 11, 1985, Pat. No. 4,596,758. This application Dec. 13, 1985, Ser. No. 808,524

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.⁴ G03C *1/68, 1/90*; G03F *3/00*

U.S. Cl. 430—15 **23 Claims**



18. A pressure sensitive transfer sheet having at least one color ink image on a substrate for color proofing or the like comprising a substrate, a dry release lacquer base layer on the substrate; a dry color ink layer on the dry release lacquer base layer; a dry white ink layer on the dry color ink layer; a fine powder coating on the dry white ink layer; and a hardened photoresist layer on the powered ink layer resulting from exposure of the layered substrate to a radiation source through an image carrying film negative for a predetermined duration forming imaged and nonimaged areas, the hardened photoresist layer being present only over the imaged areas; the lacquer, ink and powdered layers being present only between the substrate and the hardened photoresist layers, where present, and a pressure dry pressure sensitive adhesive layer over the entire surface including both imaged and nonimaged areas.

19. The pressure sensitive transfer sheet according to claim 18 wherein there are plural superimposed imaged areas formed employing different film negative in registry and at least a second different color ink whereby to form a multicolor composite image, each color image characterized by lacquer, ink layers, powdered layers and hardened photoresist layers but only one pressure sensitive adhesive layer being present over the entire outer surface as a final coating.

4,640,879

COPYING PROCESS AND ELECTROPHOTOGRAPHIC ELEMENT UTILIZING A PHOTOCONDUCTIVE PIGMENT DISPERSED IN AN IMPROVED POLYMERIC BINDER

Petrus A. M. R. Simons, Roermond, and Wilhelmus J. Bouts, Reuver, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Aug. 6, 1985, Ser. No. 763,053

Claims priority, application Netherlands, Sep. 13, 1984, 8402805

Int. Cl.[4] G03G 5/05

U.S. Cl. 430—96 8 Claims

1. A copying process in which a transferable image is formed by charging, exposing image-wise, developing with a developing powder and then transferred onto a copying material whereupon it is fixed, wherein the transferable image is formed on an electrophotographic element comprising a support and a photoconductive layer comprising a photoconductive pigment dispersed in a binder consisting substantially of a copolymer of an acrylic or methacrylic acid ester monomer, a vinyl aryl monomer, and 1% to 3% by weight unsaturated acid wherein 2.5 to 6.0 parts by weight of copolymerized vinyl aryl monomer are present per part by weight of copolymerized acrylic or methacrylic acid ester monomer.

4,640,880

ELECTROPHOTOGRAPHIC PROCESS WITH MAGNETIC BRUSH DEVELOPMENT USING SEMICONDUCTIVE FERRITE CARRIERS

Tsuneaki Kawanishi; Yasuki Mori, both of Hitachi; Koji Noguchi, Fukiage, and Tsutomu Iimura, Tachikawa, all of Japan, assignors to Hitachi Metals Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

PCT No. PCT/JP84/00142, § 371 Date Oct. 24, 1984, § 102(e) Date Oct. 24, 1984, PCT Pub. No. WO84/03955, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 28, 1984, Ser. No. 668,877

Claims priority, application Japan, Apr. 1, 1983, 58-55124

Int. Cl.[4] G03G 9/14

U.S. Cl. 430—106.6 14 Claims

1. A method of electrophotography characterized: in that an electrostatic latent image is formed on the surface of a substance layer; in that said electrostatic latent image is developed by a magnetic brush method using semiconductive ferrite carriers and triboeletric magnetic toner with a chargeability to provide the magnetic brush, the ferrite carriers having a saturated magnetization of 20 to 90 emu/g and the magnetic toner having an intrinsic volume resistance exceeding 10^{14} Ω-cm when an electric field of a direct current of 4,000 V/cm is applied, with the magnetic brush moving at high speeds and in the same direction relative to the substance layer; and in that the developed toner image is transferred to a transfer member and then fixed.

4,640,881

METHOD FOR THE DISPERSEMENT OF MAGNETIC FILLER IN ONE-PART TONER POWDER AND THE COMPOSITION THEREFOR

William E. Dennis, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 15, 1985, Ser. No. 755,040

Int. Cl.[4] G03G 9/08, 9/14

U.S. Cl. 430—106.6 5 Claims

1. A homogeneous blend of a thermoplastic organic resin and a magnetic powder in the presence of an oleophilicizing amount of a silanol methylsiloxane resin consisting of siloxane units selected from the group consisting of methylsilsesquioxane unit, dimethylsiloxane unit, trimethylsiloxy unit, and SiO_2 unit in which there is at least one siloxane unit having methyl radicals bonded thereto.

4,640,882

IMAGE FORMING METHOD OF NEGATIVE LATENT IMAGES USING SILICA PARTICLES

Yasuo Mitsuhashi, Yokohama; Masaki Uchiyama; Kazunori Murakawa, both of Tokyo, and Kenji Okado, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 628,839

Claims priority, application Japan, Jul. 19, 1983, 58-131341

Int. Cl.[4] G03G 9/10

U.S. Cl. 430—110 19 Claims

1. An image forming method comprising the steps of:

(i) forming a negative latent image on a photosensitive member comprising an organic photoconductive material,

(ii) developing said latent image with a positively chargeable dry toner,

(iii) transferring the developed image obtained to a transfer material, and

(iv) cleaning the residual toner on the photosensitive member,

wherein said positively chargeable dry toner comprises colored resinous particles and positively chargeable fine silica particles which have been obtained by treating fumed silica particles having a mean primary particle size of 0.001 to 2μ to provide positive chargeability.

4,640,883

METHOD OF FORMING COMPOSITE OR DICHROMATIC IMAGES

Tateki Oka, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1984, Ser. No. 674,281

Claims priority, application Japan, Nov. 30, 1983, 58-227472

Int. Cl.[4] G03G 13/08

U.S. Cl. 430—122 7 Claims

1. An image forming method comprising:

a first step of forming on a photosensitive member electrostatic latent images having at least three, different potential levels and including a first electrostatic latent image represented by a first potential relative to a background area potential and a second electrostatic latent image represented by a second potential relative to the background area potential;

a second step of developing said first and second electrostatic latent images by first magnetic brush developing means using two kinds of toners at least one of which is magnetic and which are chargeable to polarities opposite to each other while applying to a developing electrode a bias voltage capable of depositing the magnetic toner on the background potential area thereby selectively depositing the two toners on the first and second latent images and the magnetic toner on the background potential area, and further collecting the deposited magnetic toner from the background potential by second magnetic brush developing means; and

a third step of transferring the developed images onto a paper.

4,640,884

PHOTOSENSITIVE COMPOUNDS AND LITHOGRAPHIC COMPOSITION OR PLATE THEREWITH HAVING O-QUINONE DIAZIDE SULFONYL ESTER GROUP

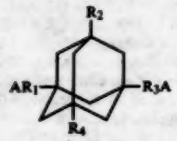
William Rowe, Califon, and Thomas Dooley, Teaneck, both of N.J., assignors to Polychrome Corp., Yonkers, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,988

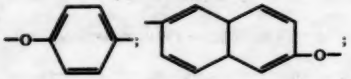
Int. Cl.[4] G03C 1/54; C07C 35/22, 113/00

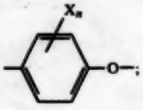
U.S. Cl. 430—165 9 Claims

1. A compound having the structural formula

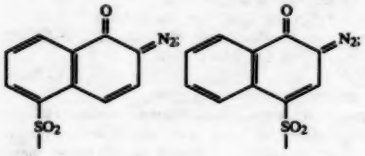


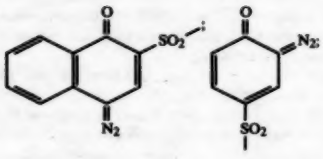
wherein, R_2 and R_4 are hydrogen or an alkyl group having from 1 to 20 carbon atoms;
wherein R_1 and R_3 may be the same or different and are hydrogen,

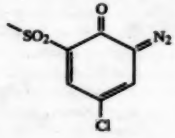




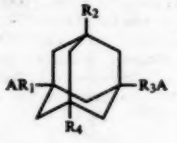
except that R_1 and R_3 may not both be hydrogen, and where X is a halogen and n is 1 to 4; and
wherein A is a quinone diazide from the group consisting of



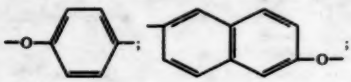


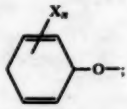


4. A composition comprising a photosensitizer suitable for use in making lithographic printing surfaces, which is the reaction product of (a) an adamantane and (b) a diazo; said reaction product having the structural formula

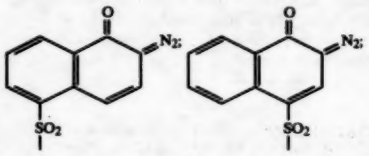


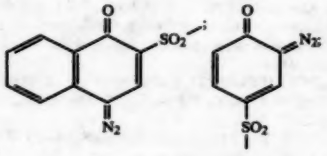
wherein, R_2 and R_4 are hydrogen or an alkyl group having from 1 to 20 carbon atoms;
wherein R_1 and R_3 may be the same or different and are hydrogen,

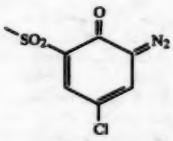




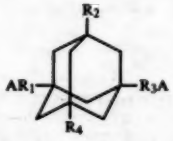
except that R_1 and R_3 may not both be hydrogen, and where X is a halogen and n is 1 to 4; and
wherein A is a quinone diazide from the group consisting of



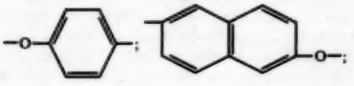




8. A lithographic plate comprising a base support and a photosensitive composition comprising an adamantane derivative having the formula



wherein, R_2 and R_4 are hydrogen or an alkyl group having from 1 to 20 carbon atoms;
wherein R_1 and R_3 may be the same of different and are hydroggen;



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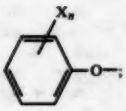
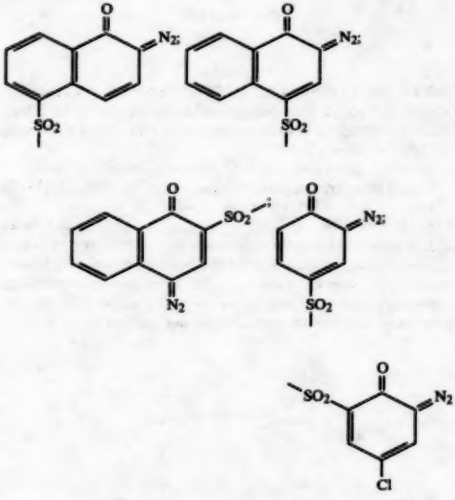


except that R_1 and R_3 may not both be hydrogen, and where X is a halogen and n is 1 to 4; and

wherein A is a quinone diazide from the group consisting of



4,640,885

MONO-SULFONYL AZIDE COMPOSITION USED TO PHOTOLYTICALLY DEVELOP A COLORED IMAGE ON A CELLULOSIC MATERIAL

Ronald S. Lenox, Lancaster; Anne L. Schwartz, Columbia, both of Pa., and Charles E. Hoyle, Hattiesburg, Miss., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 555,298, Nov. 25, 1983, Pat. No. 4,556,625, which is a continuation-in-part of Ser. No. 396,800, Jul. 9, 1982, abandoned. This application Jun. 28, 1985, Ser. No. 749,665

Int. Cl.[4] G03C 1/72, 1/727

U.S. Cl. 430—197 9 Claims

1. A photolytically active composition for coloring a cellulosic material, said composition consisting essentially of a mixture of poly(N-vinylcarbazole) and at least one sulfonyl azide compound of the formula

$$R—SO_2N_3$$

wherein R is an aliphatic, aryl aliphatic or aryl radical which contains from 1 to about 25 carbon atoms, wherein the amount of poly(N-vinyl-carbazole) and sulfonyl azide compound is a sufficient amount to enable (1) the mixture to become solvent insoluble after exposure to ultra-violet light and (2) the mixture when present on the cellulosic material to photolytically develop on exposure to ultra-violet light to form a colored image.

4,640,886

SUBBED LITHOGRAPHIC PRINTING PLATE

Gary R. Miller, Fort Collins, Colo., and Richard E. Gilson, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1985, Ser. No. 786,013

Int. Cl.[4] G03C 1/495; C23C 1/08

U.S. Cl. 430—271 9 Claims

1. In a lithographic printing plate comprising an anodized aluminum support material, a hydrophilic subbing layer and a radiation-sensitive layer, the improvement wherein said hydrophilic subbing layer comprises benzoic acid in an amount sufficient to improve the incubation stability of said plate.

4,640,887

PHOTOSENSITIVE IMAGE-FORMING MATERIAL COMPRISED OF CARBOXYL GROUPS DEVELOPABLE IN AQUEOUS ALKALINE BASE SOLUTIONS

Chiaki Nakamura, Tokyo; Koji Oe; Tomonobu Muta, both of Urawa; Toshiki Sasaki, Kamifukuoka, and Yoshihiro Nishio, Ohmiya, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,547

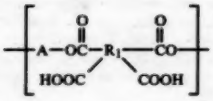
Claims priority, application Japan, Feb. 9, 1984, 59-20739; Mar. 13, 1984, 59-46429

Int. Cl.[4] G03C 1/71, 1/94; C08G 63/18

U.S. Cl. 430—275 20 Claims

1. A photosensitive image-forming material developable with aqueous alkali developers comprising a support and a photosensitive layer on said support, which is characterized in that a photosensitive resin having the structural units represented by the general formula

[I]



(wherein A represents a linear polyester structural unit containing in its main chain a dicarboxylic acid unit having a photosensitive, unsaturated double bond adjacent to the aromatic ring, and a glycol unit containing an alicyclic ring structure or an aromatic ring structure, and R_1 represents a tetravalent organic group) is contained in the photosensitive layer.

11. The image-forming material of claim 1 in which the photosensitive layer is applied onto a support having a roughened metal surface.

4,640,888

ALIGNMENT MARK ON A SEMICONDUCTOR AND A METHOD OF FORMING THE SAME

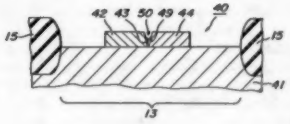
Yoshio Itoh; Hiroshi Ohtsuka; Tadashi Nishimuro, and Norio Moriyama, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Japan

Division of Ser. No. 619,960, Jun. 12, 1984, abandoned. This application Jan. 17, 1985, Ser. No. 691,977

Claims priority, application Japan, Jun. 16, 1983, 58-106646

Int. Cl.[4] G03C 5/00; G03F 9/00

U.S. Cl. 430—323 2 Claims



1. A method of forming an alignment mark for registering a

semiconductor wafer, said wafer being registered by scanning an incident light across the alignment mark, the method comprising the steps of:

preparing a semiconductor substrate;

providing on the surface of the semiconductor substrate a grid line region to serve as a section for dividing the semiconductor wafer into a plurality of chips;

providing a first island region of polycrystalline silicon on the grid line region;

providing a film of phospho-silicate glass on the surfaces of the first island region and the semiconductor substrate;

subjecting the phospho-silicate glass film to photolithographic etching for forming a second island region adjacent to the first island region, thereby forming an elongated slit having a width of 1 μm or less between the first and second island regions, said elongated slit serving as the alignment mark by reflecting as only one peak the incident light scanning thereacross.

4,640,889

LIGHT-SENSITIVE SILVER HALIDE MULTI-LAYER COLOR PHOTOGRAPHIC MATERIAL

Kazuo Komorita; Masanobu Miyoshi, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

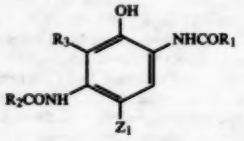
Filed Apr. 15, 1985, Ser. No. 723,048

Claims priority, application Japan, Apr. 20, 1984, 59-80582

Int. Cl.⁴ G03C *1/40, 1/76*

U.S. Cl. 430—505 **12 Claims**

1. A light-sensitive silver halide multi-layer color photographic material having a light-sensitive silver halide emulsion layer on a support, comprising a red-light-sensitive silver halide emulsion layer, a green-light-sensitive silver halide emulsion layer and a blue-light-sensitive silver halide emulsion layer, said red-light-sensitive silver halide emulsion layer being the light-sensitive silver halide emulsion layer farthest from the support and containing mono-dispersed silver halide grains comprising primarily (100) faces and having an average grain size of 0.2 to 0.8μ and a non-diffusion cyan coupler represented by the formula:



wherein R_1 represents an aryl group, a cycloalkyl group or a heterocyclic group; R_2 represents an alkyl group or a phenyl group; R_3 represents a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group; Z_1 represents a hydrogen atom, a halogen atom or an eliminable group through the reaction with the oxidized product of an aromatic primary amine type color developing agent.

4,640,890

COLOR PHOTOGRAPHIC MATERIAL WITH LIGHT INSENSITIVE SILVER CHLORIDE

Munehisa Fujita, and Akio Mitsui, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 31, 1985, Ser. No. 760,851

Claims priority, application Japan, Jul. 31, 1984, 59-161238

Int. Cl.⁴ G03C *1/46, 1/40, 7/32*

U.S. Cl. 430—504 **13 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one red-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer, and at least one blue-sensitive silver halide emulsion layer, with at least one of said light-sensitive silver halide emulsion layers containing a mono-dispersed silver halide emulsion, said color photographic material further comprising at least one auxiliary layer containing silver halide grains having substantially light-insensitivity and containing more than 75 mole% silver chloride, wherein said auxiliary layer is formed on the outside of the light-sensitive silver halide emulsion layer disposed outermost of the light-sensitive silver halide emulsion layers with respect to the support thereof.

4,640,891

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yoshiharu Yabuki; Kozo Sato; Ken Kawata, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

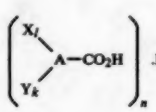
Filed Aug. 23, 1985, Ser. No. 768,655

Claims priority, application Japan, Aug. 24, 1984, 59-175123

Int. Cl.⁴ G03C *1/06, 5/24*

U.S. Cl. 430—551 **21 Claims**

1. A heat developable light-sensitive material comprising a support having thereon at least one heat developable light-sensitive layer comprising a silver halide emulsion and a reducing agent, wherein said light-sensitive material contains a base precursor represented by the following general formula (I):



wherein

A represents an organic residue represented by the following general formula (II):

—CO_2H of formula (I) is bonded to a skeletal carbon atom of the organic residue represented by the formula (II);

X represents an electron attractive substituent having a Hammett's sigma value of more than 0;

L represents an integer of 1 to 5 and, when represents 2 or more, a plurality of Xs may be the same or different;

Y represents a substituent having a Hammett's sigma value of 0 or less;

k represents an integer of 0 to 5 and, when k represents 2 or more, a plurality of Ys may be the same or different;

Z represents a divalent organic residue selected form the group consisting of —C=C—, —O—, —S— and —NR—, wherein R represents a hydrogen atom or a substituent selected from the group consisting of an alkyl group, an alkenyl group, an aralkyl group, an aryl group and an acyl group;

the broken line in the general formula (II) represents that the cyclic compound containing Z may be optionally fused with a benzene ring;

B represents a mono- or diacidic base having a pKa value of 7 or more and containing 12 or less carbon atoms; and

n and m represent an integer of 1 or 2 and are in such relation that the number of positive charge is equal to that of negative charge.

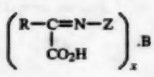
4,640,892

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Ken Kawata; Yoshiharu Yabuki; Kozo Sato, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1985, Ser. No. 769,275
Claims priority, application Japan, Aug. 24, 1984, 59-176401
Int. Cl.[4] G03C 1/02
U.S. Cl. 430—617 5 Claims

1. A heat-developable light-sensitive material comprising a support having thereon a silver halide emulsion layer, a reducing agent present in said emulsion layer or in a separate layer, wherein at least one layer contains a base precursor compound represented by formula (I)



(I)

wherein R represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic ring group and a substituted or unsubstituted aralkyl group;

Z represents

$-OR_3$, $-SR_4$, or $-CR^6{=}CR^7)_nR^5$

wherein R^1 and R^2 each represents a hydrogen atom, a substituted or unsubstituted aryl group, a substituted or unsubstituted acyl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, a substituted or unsubstituted sulfamoyl group or a substituted or unsubstituted heterocyclic ring group; or R^1 and R^2 combine together to form a ring;

R^3 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted carbamoyl group, a substituted or unsubstituted sulfamoyl group or a substituted or unsubstituted heterocyclic ring group.

R^4 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic ring group; p1 R^5 represents a hydroxyl group, a substituted or unsubstituted acylamino group, a substituted or unsubstituted alkylsulfonylamino group, or a substituted or unsubstituted arylsulfonylamino group;

R^6 and R^7, respectively, represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, or a substituted or unsubstituted aryl group, or R^6 and R^7 combine together to form a ring;

n represents an integer or 1 or 2

B represents an organic base;

x represents an integer of 1 when B is a base having acidity of 1, and x represents an integer of 2 when B is a base having an acidity of 2.

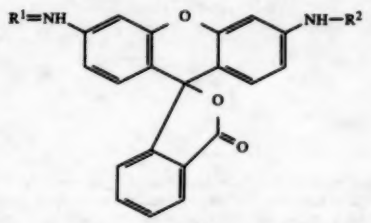
4,640,893

NOVEL RHODAMINE DERIVATIVES AS FLUOROGENIC SUBSTRATES FOR PROTEINASES

Walter F. Mangel, Urbana, Ill.; Stephen Leytus, Seattle, Wash., and L. Lee Melhado, Urbana, Ill., assignors to University of Illinois, Urbana, Ill.

Division of Ser. No. 546,718, Oct. 28, 1983, Pat. No. 4,557,862.
This application Sep. 27, 1985, Ser. No. 780,852
Int. Cl.[4] C12Q 1/38; C07K 17/14
U.S. Cl. 435—23 7 Claims

6. A method for attaching a blocked fluorogenic compound to a protein which comprises placing a compound of the formula



wherein R^1 is blocking group and R^2 is an antigen-specific antibody in the presence of a protein which will react with the antigen-specific antibody, and allowing the antibody to react with the protein.

4,640,894

PRODUCTION OF ISOMALTULOSE USING IMMOBILIZED MICROORGANISMS

Mohammad Munir, Obrigheim, Fed. Rep. of Germany, assignor to Suddeutsche Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 290,083, Aug. 4, 1981, abandoned. This application Oct. 30, 1985, Ser. No. 793,005
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038219
Int. Cl.[4] C12P 19/12; C12N 11/02, 11/10, 11/12
U.S. Cl. 435—100 10 Claims

1. A process for producing isomaltulose by enzymatic conversion of sucrose using dead immobilized cells of an isomaltulose-forming microorganism comprising continuously passing a pure sucrose solution having a concentration of from 45 to 75% by weight sucrose at a temperature of about 45° to 65° C. through a reactor filled with said dead, immobilized cells of an isomaltulose-forming microorganism so that the sucrose is converted to a product containing primarily isomaltulose.

4,640,895

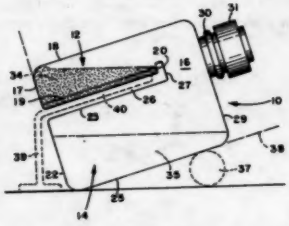
BIPHASIC MEDIA CULTURE APPARATUS

Sherman G. Davis, Shaker Heights, Ohio, assignor to Gibco Division, The Mogul Corporation, Chagrin Falls, Ohio

Filed Oct. 15, 1982, Ser. No. 432,848
Int. Cl.[4] C12M 1/24, 1/18, 1/26; B65D 1/04
U.S. Cl. 435—296 3 Claims

1. An apparatus for culturing microbial, mammalian, and plant cells comprising a one piece container made from a transparent material and having only two compartments formed by respective base means and wall means wherein the base and wall means of the first compartment includes a first base and first inner wall and the base and wall means of the second compartment includes a second base coplanar with and spaced from the first base and a second inner wall spaced from the first inner wall to define a recess therebetween, the first compartment for liquifiable but normally solid nutrient medium and the second compartment for liquid nutrient medium, said compartments being separated by the recess and being

discrete from each other with respect to their respective base means and wall means but sharing a common headspace extending between said first and second compartments to provide selective fluid communication therebetween, said headspace being enclosed by a top wall having a neck extending upwardly from said top wall to define a sealable access orifice therein positioned selectively to provide direct communication with either compartment, said neck being closed and hermetically sealed with a screw cap having a puncturable but self



resealing septum therein to permit sample injection for culturing without breaking the hermetic seal between the cap and the neck and a connecting member of material extending between the opposing inner walls of the respective compartments across the recess therebetween, said connecting member being configured to allow the container to be conveniently tilted to permit the solid nutrient medium to gel on a slant in the first compartment and to be conveniently inverted or agitated to wash the liquid medium back and forth over the solid medium.

4,640,896

WHOLE BLOOD CLOTTING TIMER

Peter C. Farrell, Pymble; Christopher D. Bertram, Coogee, and Bruce K. Milthorpe, Naremburn; all of Australia, assignors to Unisearch Limited, Kensington, Australia

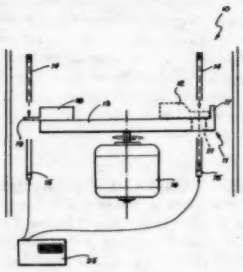
PCT No. PCT/AU82/00180, § 371 Date Jun. 28, 1983, § 102(e) Date Jun. 28, 1983

PCT Filed Nov. 4, 1982, Ser. No. 514,828

Claims priority, application Australia, Nov. 4, 1982, PF1422

Int. Cl.[4] G01N *21/82, 33/86*

U.S. Cl. 436—34 **1 Claim**



1. A method for determining the clotting time for a whole blood sample comprising inserting the whole blood sample into a first, radially inner compartment of a disposable cuvette in a centrifuge, inserting a blood clotting activator into a second, radially outer compartment of that cuvette which is separated from the first compartment by a ridge in the floor of the cuvette, actuating the centrifuge to cause the whole blood sample to flow radially outwardly over the ridge and to mix with the blood clotting activator in a second compartment and simultaneously starting timing means running, continuing the operation of the centrifuge to sediment the blood cells against a radially outer wall of the second compartment, periodically measuring the optical density of a part of the mixture in the second compartment radially inwardly of said wall thereof which part of the mixture is freed from blood cells, stopping the timing means when the optical density or the time rate of change of the optical density of the mixture reaches a predetermined level, thereafter stopping the centrifuge and indicating the time interval between the starting and stopping of the timing means.

4,640,897

IMMUNOANALYSIS OF BASOPHIL-CONTAINING BLOOD FRACTION FOR DIAGNOSING PARASITOSES AND ALLERGIES

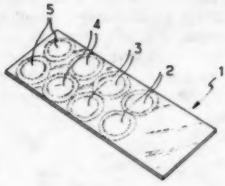
Francisque Leynadier, and Hervé Luce, both of Paris, France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 163,736, Jun. 27, 1980, abandoned. This application May 2, 1983, Ser. No. 489,603

Claims priority, application France, Jun. 28, 1979, 79 16772; May 27, 1980, 80 11689

Int. Cl.[4] G01N *33/566, 33/531, 33/554, 31/00*

U.S. Cl. 436—501 **17 Claims**



1. A process, for diagnosing parasitoses and allergies which cause an increase of the circulating specific immunoglobins, comprising the steps of:

selecting a plurality of slides or dishes, each exhibiting a predetermined number of wells of equal diameter all of which, with the exception of the wells that are to act as controls, contain a predetermined amount of an antigen specific to a parasitosis or allergy to be diagnosed, said antigen having been introduced in the dry state in each of the wells, said predetermined amounts varying from one well column to the next,

a plurality of tubes containing premeasured amounts of a suitable buffer devoid of calcium and magnesium and heparin salts that is not destructive of basophil cells;

a plurality of suitable containers, each containing a liquid of density 1.079–1.085, and

at least one container containing a dilute alcoholic solution of a dye, said dye capable of dyeing basophil cells, said alcoholic solution comprising a mixture of ethanol or methanol with water and at least one of glutaraldehyde, formaldehyde or propylene glycol for fast, simultaneous fixing and dyeing of said slides or dishes; wherein said suitable buffer comprises 4–25 ml of Hepes buffer, molar solution, 0.932–1.2 ml 10% KCl, 850–900 ml 9% NaCl and water, q.s. for 1000 ml at pH 7.4–7.6, and wherein each of the wells of said slides or dishes further contain premeasured amounts of calcium and magnesium in the form of their salts,

mixing a sample of a blood specimen from a human or animal patient assumed afflicted with a parasitosis or with an allergy, with an amount of ethylenediamine tetraacetic acid or one of its sales effective to preserve said blood sample for twenty-four hours;

mixing the preserved whole blood sample with an equal volume of the buffer devoid of calcium, magnesium and heparin salts from said plurality of tubes containing buffer;

either injecting under this mixture the density liquid from said plurality of containers containing density liquid or

transferring the blood/buffer mixture to one of said containers containing said density liquid;

removing said ring and washing it with the buffer from said plurality of tubes containing buffer, centrifuging, discarding the buffer supernatant, and resuspending said cellular cull to thereby obtain a diagnostic reagent consisting of a suspension of basophil plynuclears carrying specific IgE'S;

placing said diagnostic reagent into the wells of said slides or dishes, for about 15 minutes at 37° C.;

performing simultaneous, fast fixing and dyeing of the prepared slide performed with said fixing and dyeing dilute alcoholic solution from said at least one container to selectively dye the cytoplasmatic granules of the basophils by contacting the slide or dish, for about 5 to 15 minutes, with the solution;

counting the basophil polynuclears with an optical microscope, respectively in the control wells and in the various wells containing the reagent and various concentrations of antigen; and

comparing the reduction of the number of basophil polynuclears in the wells containing the antigen in various concentrations with the number of basophil polynuclears contained in the control wells, in order to determine the degranulation index (DI):

$$DI = \frac{\text{control } BP - \text{antigen } BP}{\text{control } BP} \times 100$$

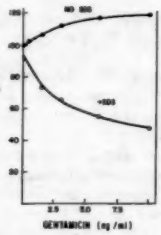
whereby, if the DI is above 35%, the presence of the parasitosis or allergy that is sought may be diagnosed.

4,640,898

HOMOGENEOUS FLUORESCENCE LIGAND BINDING ASSAY BASED UPON PREFERENTIAL ALTERATION OF THE RESPECTIVE INTENSITIES OF BOUND AND FREE LABEL BY SOLVENT COMPONENTS

Clarke J. Halfman, Highland Park, Ill., assignor to University of Health Sciences/The Chicago Medical School, North Chicago, Ill.

Filed Aug. 1, 1983, Ser. No. 518,965
Int. Cl.[4] G01N 33/533
U.S. Cl. 436—546 **1 Claim**



1. A method for conducting a ligand binding assay to determine the concentration of an analyte in a sample containing an unknown amount of the analyte comprising the steps of:

preparing an aqueous solution containing the sample, a conjugate comprising the analyte and the fluorescent dye fluorescein, a protein that binds specifically and strongly to the analyte, and the surfactant, sodium dodecyle sulphate, having a micelle threshold, the surfactant concentration being greater than said micelle threshold; and

measuring the intensity of fluorescent emission from said solution while irradiating said solution with electromagnetic radiation;

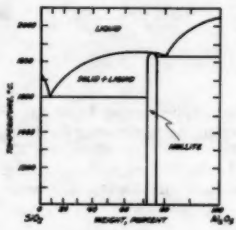
said surfactant effecting different fluorescence intensities from bound conjugate and from free conjugate.

4,640,899

MULLITE MATRIX COMPOSITE

William B. Hillig, Ballston Lake, N.Y., and Solomon Musikant, Paoli, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,199
Int. Cl.[4] C03C 10/04, 14/00; C04B 35/18, 35/58
U.S. Cl. 501—5 **60 Claims**



1. A composite consisting essentially of a continuous interconnecting polycrystalline mullite phase ranging from about 40% by volume to about 80% by volume of said composite and a polycrystalline inorganic non-oxide filler phase ranging from about 20% by volume to about 60% by volume of the composite, said mullite phase encapsulating at least about 50% by volume of said filler phase and encapsulating and being intermixed with the balance of said filler phase, said filler phase being distributed at least significantly uniformly in said composite, said composite having a porosity of less than about 5% by volume of said composite.

4,640,900

LOW EXPANSION GLASS

Yoshinori Kokubu, Tokyo, and Makoto Moriyasu, Yokohama, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,268
Claims priority, application Japan, Aug. 16, 1983, 58-148808
Int. Cl.[4] B32B 17/06; C03C 3/093; G03F 9/00
U.S. Cl. 501—67 **2 Claims**

1. A low expansion transparent glass substrate consisting of, all by weight, from 55 to 65% of SiO_2, from 10 to 20% of Al_2O_3, from 2 to 10% of B_2O_3, from 3 to 10% of MgO, from 1 to 8% CaO, from 2 to 10% of ZnO, from 1 to 4% of R_2O where R is an alkali metal atom and of which at least 1% is Na_2O, from 0.1 to 4% of ZrO_2, from 0 to 5% of at least one component of refining agent selected from the group consisting of Cl_2, F_2, Sb_2O_3 and As_2O_3, and SO_3, and from 0 to 3% of R'O where R' is alkaline earth metal atom selected from Ba, Sr and Pb, and said low expansion transparent glass substrate has an expansion coefficient of from 30 to 45×10^{-7}/°C. (from 50° to 350° C.), said glass having a temperature at the softening point of from about 890° C. to not higher than 930° C.

4,640,901

HIGH TEMPERATURE MEMBRANE

Kew-Ho Lee, and Soon-Jai Khang, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

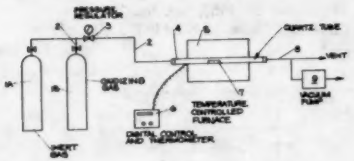
Filed Mar. 18, 1985, Ser. No. 712,862
Int. Cl.[4] C04B 38/06
U.S. Cl. 501—81 **16 Claims**

1. A method of forming a membrane capable of withstanding high temperatures for separating gases comprising the steps of:

(1) pyrolyzing a silicon-based material having hydrocarbons and SiO chains in its structure to drive off substantially all hydrocarbons, said pyrolyzed silicon-based material consisting essentially of loosely connected SiO chains, said pyrolyzing being conducted at a temperature range of

from about 500° C. to about 1000° C., for a minimum duration of about 2 hours, in an inert gaseous atmosphere under positive pressure; and

(2) oxidizing said pyrolyzed silicon-based material in an



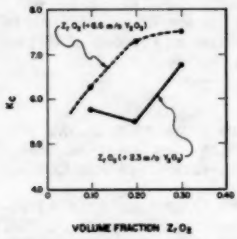
oxidizing atmosphere to crosslink said SiO radicals to form silica, said oxidizing being conducted at a temperature from about 300° C. to about 1000° C., for a minimum duration of about 2 hours, thereby forming a porous membrane capable of withstanding high temperatures.

4,640,902

LOW THERMAL CONDUCTIVITY Si_3N_4/ZrO_2 COMPOSITE CERAMICS

Fred F. Lange, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1985, Ser. No. 739,807
Int. Cl.[4] C04B 35/58
U.S. Cl. 501—97 **18 Claims**



1. A composition for producing low thermal conductivity and high fracture toughness Si_3N_4/ZrO_2 composite ceramics substantially free of Zr-oxynitride by sintering, which comprises a mixture of about 50 to about 80% Si_3N_4, 20 to about 50% ZrO_2 (by volume), and Y_2O_3 as additive in an amount from about 3 to about 7 mole % based on ZrO_2, sufficient to prevent formation of Zr-oxynitride during sintering.

4,640,903

SILICON NITRIDE SINTERED BODIES AND A METHOD FOR PRODUCING THE SAME

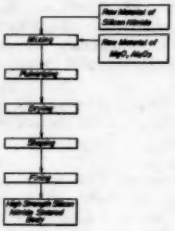
Keiji Matsuhiro, and Minoru Matsui, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Continuation-in-part of Ser. No. 502,288, Jun. 8, 1983, Pat. No. 4,558,018. This application Sep. 16, 1985, Ser. No. 776,456
Claims priority, application Japan, Apr. 4, 1983, 58-57915
The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.
Int. Cl.[4] C04B 35/58
U.S. Cl. 501—97 **4 Claims**

1. Silicon nitride sintered bodies consisting essentially of MgO and Al_2O_3 in a total amount of more than 7% by weight and not more than 30% by weight and in a weight ratio of MgO/Al_2O_3 of 5–15, and silicon nitride having an oxygen content of not greater than 2% by weight, said oxygen content being exclusive of the amount of oxygen contained in the MgO and in the Al_2O_3, wherein crystals in the sintered bodies consist essentially of Si_3N_4 crystals and at least one crystalline species selected from the group consisting of magnesium sialon represented by the general formula

$$Mg_{x-2}Si_{6-y+x/2}Al_{y-x}O_yN_{8-y}$$

wherein $0<x<y<8$ and forsterite represented by the formula Mg_2SiO_4 as a second phase, wherein a ratio of x to y (x/y) in the general formula of magnesium sialon crystal is equal to or greater than 0.9 but less than 1, and substantially no glass is present at boundaries between the crystalline species.



3. A method for producing silicon nitride sintered bodies, comprising mixing a raw material powder of silicon nitride containing not greater than 2% by weight of oxygen with MgO and Al_2O_3 so that a total amount of MgO and Al_2O_3 is from 7% by weight to 30% by weight and a weight ratio of MgO/Al_2O_3 is 5–15, pulverizing said mixture under conditions whereby oxidation of the silicon nitride is substantially prevented, and firing the resulting mixture at a temperature of 1,650°–1,850° C. in nitrogen or in an inert gas atmosphere under substantially atmospheric pressure to result in a silicon nitride sintered body having substantially no glass present at grain boundaries therein.

4,640,904

MULLITE BY REACTIVE HOT PRESSING

William B. Hillig, Ballston Lake, N.Y., and Solomon Musikant, Paoli, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,536
Int. Cl.[4] C04B 35/18
U.S. Cl. 501—128 **12 Claims**

1. A body consisting of polycrystalline mullite phase of substantially uniform grain size having an average grain size of less than 2 microns and a porosity of less than about 2% by volume of said body.

7. A process for producing a body consisting essentially of polycrystalline mullite phase of substantially uniform grain size having an average grain size of less than 15 microns and a porosity of less than about 5% by volume which consists essentially of forming a mixture of amorphous alumino-silicate glass powder, alumina powder and nucleating polycrystalline mullite powder, said glass powder consisting essentially of from about 15% by weight to about 40% by weight Al_2O_3 balance SiO_2 and having a liquidus temperature below about 1800° C., said glass powder and alumina powder being present in amounts required to produce mullite, said nucleating mullite powder having a particle size of less than 15 microns and ranging from about 0.1% by weight to about 10% by weight of the total weight of said glass powder and alumina powder, and hot pressing the mixture at a temperature at which said glass is fluid ranging from about 1500° C. to about 1750° C. but below its liquidus temperature under a pressure at least sufficient to force the fluid glass to dissolve said alumina powder and react with it forming said polycrystalline body.

4,640,905

DIELECTRIC COMPOSITIONS

Ian Burn, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 729,479, May 1, 1985. This application Jan. 7, 1986, Ser. No. 816,844
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—137 5 Claims

1. A composition for forming a densified dielectric body at low firing temperatures consisting essentially of a mixture of finely divided particles of:

a. $BaTiO_3$,

b. $A(Zn_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$,

c. A Curie point shifter selected from $BaZrO_3$, $PbZrO_3$, $BaSnO_3$, $PbSnO_3$ and mixtures thereof,

d. a manganese-doped metal borate flux (F) selected from zinc borates in which the ratio of ZnO to B_2O_3 is 2–4 and mixtures and oxide precursors thereof,

the proportions of a.–d. being substantially equivalent stoichiometrically to the formula:

$$(1-X)[(Ba_{1-x}Pb_x)(Ti_{1-(u+v)}Zr_uSn_v)O_3]+X[A(Zn_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3]+Y[F],$$

wherein A is selected from Pb, Ba and mixtures thereof

X =	2.5	to	11.5% by weight,
Y =	1.0	to	5.0%
u =	0	to	0.125,
v =	0	to	0.125,
x =	0	to	0.125, and
$u+v$ =	0.015	to	0.125.

4,640,906

CATALYST FOR THE POLYMERIZATION OF OLEFINS

Minoru Terano; Yasushi Yokoyama; Masuo Inoue, and Katsuyoshi Miyoshi, all of Kanagawa, Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 793,750
Claims priority, application Japan, Nov. 1, 1984, 59-229024
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—104 34 Claims

16. A process for the preparation of a solid catalyst component utilizable for the polymerization of olefins which consists essentially of mixing (a) a dialkoxymagnesium and (b) a diester of an aromatic dicarboxylic acid with (c) a halogenated hydrocarbon to form a suspension and thereafter adding the suspension to (d) a titanium tetrahalide thereby effecting reaction to obtain a solid matter.

4,640,907

POLYMERIZATION CATALYST, PRODUCTION AND USE

Steven A. Best, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,321
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—115 34 Claims

1. A transition metal containing solid prepolymerized catalyst component comprising the prepolymerized solid reaction 3 product obtained by treating an inert solid support material in an inert solvent sequentially with (A) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon group, (B) an oxygen containing compound selected from ketones, aldehydes, alcohols or mixtures thereof, (C) an acyl halide, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal , (E) a Group IIIa metal hydrocarbyl dihalide and prepolymerizing the solid with a minor amount of ethylene with the proviso that the inert solid support material can alternatively be treated with (i) the (A) organometallic compound and the (B) oxygen containing compound simultaneously, (ii) the reaction product of the (A) organometallic compound and (B) oxygen containing compound or (iii) the (B) oxygen containing compound followed by treating with the (A) organometallic compound.

4,640,908

CATALYST FOR THE OXIDATION OF HYDROGEN SULFIDE AND PROCESS FOR THE PREPARATION OF THE CATALYST

Thierry Dupin, Garges/les/Gonesse, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 575,577, Jan. 31, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 778,680
Claims priority, application France, Jan. 31, 1983, 83 01426
Int. Cl.[4] B01J *21/04, 21/08, 23/02, 23/10*
U.S. Cl. 502—243 23 Claims

1. A process for the preparation of an oxidation catalyst comprising (i) hydrothermally treating at least a portion of an active alumina support with an aqueous medium, in liquid or vapor phase, comprising an acid, salt, or mixture thereof which dissociates in water to provide a solution having a pH of less than about 9, at a temperature ranging from about 80° C. to about 250° C. for up to 36 hours, and (ii) thence depositing upon said at least partially hydrothermally treated support a catalytically effective amount of a catalytically active oxide phase which comprises the oxides of at least one of the metals, Fe, Cu, Ag, W, Co, Ni, Bi, Cr and Cd, with the provision (iii) that at least one rare earth oxide, alkaline earth metal oxide, zirconium oxide or silica, or any precursor compound thereof, is incorporated into the catalyst during either of the steps (i) or (ii).

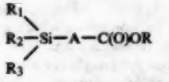
4,640,909

BONDED PHASE OF SILICA AND CARBOALKOXYALKYL SILANES FOR SOLID PHASE EXTRACTION

Hugh E. Ramsden, Scotch Plains, N.J., and Joseph M. Patterson, New Britain, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed May 7, 1985, Ser. No. 731,530
Int. Cl.[4] B01J *20/22*
U.S. Cl. 502—407 23 Claims

1. A solid phase bonded silica product comprising the reaction product of silica and a carboalkoxyalkyl silane of the formula



in which R is an alkyl radical of from 1 to 3 carbon atoms, A is an alkylene group of from 2 to 4 carbon atoms and R_1, R_2 and R_3 are the same or different and are selected from the group consisting of halogen, an alkoxy group of from 1 to 6 carbon atoms, an alkoxyalkoxy group of from 2 to 5 carbon atoms and an alkyl group of from 1 to 3 carbon atoms, with the proviso that at least one of R_1, R_2 and R_3 is other than an alkyl group.

4,640,910

ERYTHROMYCIN A SILYLATED COMPOUNDS AND METHOD OF USE

Hermann Faubl, Libertyville, Ill., and Robert G. Stein, Kenosha, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 12, 1985, Ser. No. 796,818
Int. Cl.[4] A61K *31/71*; C07H *17/08*
U.S. Cl. 514—29 8 Claims

1. A relatively acid stable erythromycin A antibiotic having a plurality of hydroxyl groups, in which one or more of the

hydroxyl groups are replaced by a group of the formula —O—SiR'R"R"', where R', R", and R"' are hydrogen or C_1 to C_8 alkyl, substituted alkyl, cycloalkyl, alkaryl or alkenyl, provided that R', R", and R"' are not all hydrogen; and pharmaceutically acceptable salts and esters thereof.

6. A pharmaceutical composition in unit dosage form, comprising a therapeutically effective amount of a compound according to claim 1 in combination with a pharmaceutical carrier.

4,640,911

ACYLATED SUGAR DERIVATIVES, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

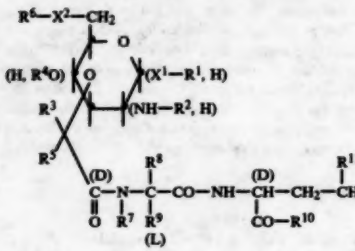
Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany, and Oskar Wacker, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 29, 1985, Ser. No. 739,269

Int. Cl.[4] A61K 31/70; C08G 18/08; C07K 9/00

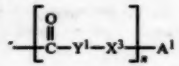
U.S. Cl. 514—42 **24 Claims**

1. A sugar derivative of the formula I



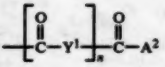
(I)

in which the sugar moiety is derived from D-glucose, D-mannose or D-galactose; X^1 represents oxygen, sulphur or the group NH; X^2 represents oxygen or the group NH; R^1, R^4 and R^6 each represents, independently of the others, hydrogen, lower alkanoyl, a radical of the formula Ia,



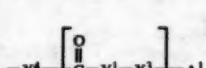
(Ia)

in which n represents 0 or 1; Y^1 represents alkylene having up to and including 18 carbon atoms which may be interrupted by carbonylimino or carbonyloxy and which is unsubstituted or substituted by carboxy, benzyloxycarbonyl, lower alkoxycarbonyl, amino, lower alkanoylamino, hydroxy and/or lower alkanoyloxy; X^3 represents oxygen or the group NH; and A^1 represents the acyl radical of a carboxylic acid selected from the group consisting of 6-chloro-5-cyclohexylindan-1-carboxylic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-propionic acid, 2-(5-chloro-4-cyclohexyl-2-hydroxyphenyl)-acetic acid, 2-[4,5-bis-(4-methoxyphenyl)-oxazol-2-yl]-2-methyl-propionic acid, 2-(3-fluoro-4-phenylphenyl)-propionic acid, (±)-5-benzoyl-3H-1,2-dihydro-pyrrolo[a]pyrrole-1-carboxylic acid, 2-[4-1,3-dihydro-1-oxo-2H-isoindol-2-yl)-phenyl]-propionic acid, 2-{2-[(2,6-dichlorophenyl)-amino]-phenyl}-acetic acid, 2-{2-[(2,6-dichloro-4-fluorophenyl)-amino-]5-fluorophenyl}-acetic acid, 2-(2,3-dimethylphenyl)aminobenzoic acid, 2-[4,5-bis-(4-methoxyphenyl)-imidazol-2-yl]-2-methylpropionic acid, 2-{2-[(2,6-dichlorophenyl)-amino-]5-fluorophenyl}-acetic acid, 2-(3-benzoylphenyl)-propionic acid, 2-S-[4,5-bis-(4-methoxyphenyl)-thiazol-2-yl]-mercaptoacetic acid, 3-S-[4,5-bis-(4-methoxyphenyl)-thiazol-2-yl]-mercaptopropionic acid, 2-{2-[(2,6-dichloro-4-fluorophenyl)-amino]-phenyl}-acetic acid, 5-(2,4-difluorophenyl)-2-hydroxybenzoic acid, 2-(6-cloro-9H-carbazol-2-yl)-propionic acid, 2-(4isobutylphenyl)-propionic acid, 1-(4-chlorobenzoyl)-5-methoxy-2-methlindol-3-ylacetic acid, 2-(6-methoxynapth-2-yl)-propionic acid, 2-3-chloro-4-(3pyrrolin-1-yl)-phenyl]-propionic acid, 2-(5H-[1]benzopyrano[2,3-b]-pyridin-7-yl)-propionic acid, 5-(4methylbenzoyl)-1-methylpyrrol-2-ylacetic acid, 2-[4,5-bis-(4methoxyphenyl)oxazol-2-yl]-acetic acid, 1-benzoyl-5-methoxy-2-methlindol-3-ylacetic acid, 2-[3-hydroxybenzyl)-phenyl]-propionic acid and 2-[3-chloro-4-(pyrrol-1-yl)-phenyl]-propionic acid; or R^1, R^4 and R^6 each represents, independently of the others, a radical of the formula Ib

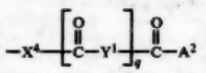


(Ib)

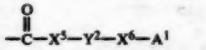
in which n and Y^1 have the meanings mentioned above and A^2 represents lower alkoxy selected from the group consisting of 2-[4,5-bis-(4-methoxyphenyl)-thiazol-2-ylthio]-ethoxy, 2-[4,5-bis-(4-methoxyphenyl)-imidazol-2-yl]-2-methylpropoxy and 3-[4,5-bis-(4-methoxyphenyl)-thiazol-2-ylthio]-propoxy; or R^1 alternatively represents benzyl which is unsubstituted or substituted in the phenyl moiety by lower alkyl, hydroxy, lower alkoxy or halogen; R^2 represents unsubstituted or hydroxy-substituted lower alkanoyl, benzoyl which is unsubstituted or substituted by lower alkyl, lower alkoxy, halogen, lower alkanoyloxy and/or lower alkanoylamino, or R^2 represents one of the above-mentioned radicals of the formulae Ia and Ib; R^3 represents hydrogen, lower alkyl or cycloalkyl and R^5 represents hydrogen, or R^3 and R^5 together represent lower alkylidene, cycloalkylidene, unsubstituted benzylidene or benzylidene that is halogenated or substituted by lower alkyl in the phenyl radical; R^7 represents hydrogen or lower alkyl, or R^7 and R^9 together represent trimethylene; R^8 represents hydrogen or lower alkyl; R^9 represents hydrogen or lower alkyl that is unsubstituted or substituted by hydroxy, mercapto, lower alkylthio, carboxy, lower alkoxycarbonyl, carbamoyl, or by a radical of the formula Ic, Id, Ie or If



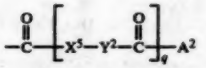
(Ic)



(Id)



(Ie)

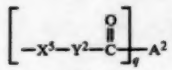


(If)

in which q represents 0 or 1; X^4 represents oxygen or sulphur; and X^5 and X^6 each represents, independently of the other, oxygen or the group NH; Y^2 represents alkylene having up to and including 18 carbon atoms in which a methylene group may have been replaced by oxygen, sulphur or sulphinyl or which may be interrupted by carbonylimino or carbonyloxy, said alkylene radical Y^2 being unsubstituted or substituted by carboxy, benyzloxycarbonyl, lower alkoxycarbonyl, amino, lower alkanoylamino, hydroxy and/or loer alkanoyloxy, and the other substituents have the meanings mentioned above; R^{10} and R^{12} each represents, independently of the other, lower alkoxy, hydroxy, amino, lower alkylamino that is substituted by carboxy, by carbamoyl, or by lower alkoxycarbonyl, and said lower alkylamino radical may be additionally substituted by amino, hydroxy, carboxy, 2-aminoethylthion, 2-aminoethoxy and/or by the sulpho group —SO_3H, or R^{10} and R^{12} each independently represent a radical of the formula Ig,

$$-X^5-Y^2-X^6-A^1 \quad \text{(Ig)}$$

in which the substituents have the meanings mentioned above, or a radical of the formula Ih,



(Ih)

in which q, X^5, Y^2 and A^2 have the meanings mentioned above; and R^{11} represents hydrogen, carboxy, lower alkoxycarbonyl or carbamoyl, said compound of the formula I having a minimum of one and a maximum of three radicals A^1 and/or A^2, or a pharmaceutically acceptable salt of such a compound having at least one salt-forming group.

4,640,912

ADMINISTRATION OF "ACTIVE" CHONDROITIN SULFATE A AND "ACTIVE" CHONDROITIN SULFATE C OR MIXTURES THEREOF TO MAMMALS INCLUDING HUMANS

Marvin S. Hausman, 124 Montana Ave., Santa Monica, Calif. 90403

Filed Jun. 9, 1983, Ser. No. 502,446
Int. Cl.[4] A61K *31/73;* **C08B** *37/00*
U.S. Cl. 514—54 **6 Claims**

1. The method which comprises the administration of "active" chondroitin sulfate A (CSA), "active" chondroitin sulfate C (CSC), or mixtures thereof to mammals including humans to the surfaces of the kidney, renal pelvis, ureter, bladder, urethra and related transitional cell surfaces by the irrigation of said surface with a solution of said drugs or mixtures thereof.

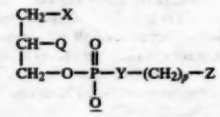
4,640,913

PHOSPHOCHOLINE DERIVATIVES HAVING ANTIHYPERTENSIVE ACTION

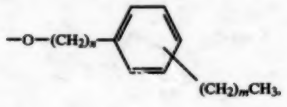
Allan Wissner, Ardsley, N.Y.; Robert E. Schaub, Upper Saddle River, N.J., and Phaik E. Sum, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

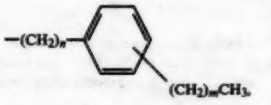
Filed Jan. 10, 1983, Ser. No. 457,097
Int. Cl.[4] A61K *31/185;* **C07F** *9/10*
U.S. Cl. 514—77 **29 Claims**

1. Compounds, including the individual R and S enantiomers and racemic mixtures, represented by the formula:



wherein: (a) X is selected from the group consisting of (i) C_1–C_{24} alkyl; (ii) C_1–C_{24} alkoxy; (iii)





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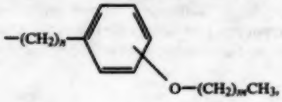
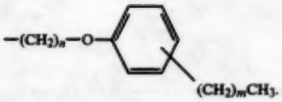
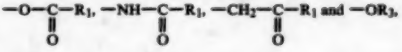
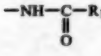




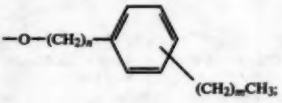
wherein n is an integer from 1 to 25 and m is an integer from 0 to 24 and the sum of n and m is less than or equal to 25; (iv) phenyl; (v) substituted phenyl wherein the substituents are selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen, trifluoromethyl, phenyl, and substituted phenyl; (vi) phenoxy; and (vii) substituted phenoxy wherein the substituents are selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen, trifluoromethyl, phenyl, and substituted phenyl; (b) Q is selected from the group consisting of:



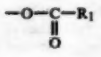
wherein R_1 is selected from the group consisting of (i) hydrogen; (ii) C_1–C_4 alkyl; (iii) C_1–C_4 alkoxy; and (iv) C_1–C_4 alkylamino and wherein R_3 is C_1–C_4 alkyl, with the provisos (i) when Q is



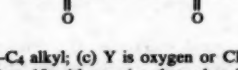
X is C_1–C_{24} alkoxy or



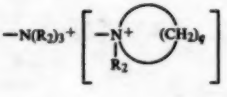
(ii) Q is not



if at the same time R_1 is C_1–C_4 alkyl, X is C_1–C_{24} alkoxy and Y is oxygen; (iii) Q is not $—OR_3$ if at the same time X is C_1–C_{24} alkoxy and Y is oxygen; and (iv) if Q is

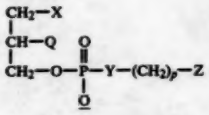


then R_1 is C_1–C_4 alkyl; (c) Y is oxygen or CH_2; (d) p is an integer from 1 to 15 with proviso that when Y is oxygen, p must be greater than 1; and (e) Z is

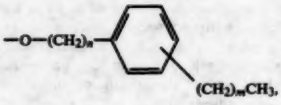


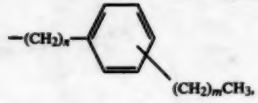
wherein R_2 is hydrogen or C_1–C_4 alkyl.

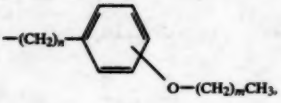
28. A method of treating hypertension in a warm-blooded animal comprising administering to said animal an effective amount of a compound, including the individual R and S enantiomers and racemic mixture, represented by the formula:

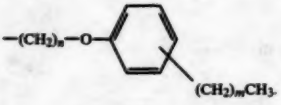


wherein: (a) X is selected from the group consisting of (i) C_1–C_{24} alkyl; (ii) C_1–C_{24} alkoxy; (iii)

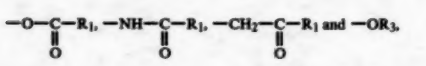




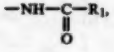




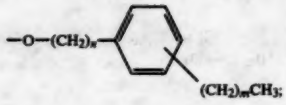
wherein n is an integer from 1 to 25 and m is an integer from 0 to 24 and the sum of n and m is less than or equal to 25; (iv) phenyl; (v) substituted phenyl wherein the substituents are selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen, trifluoromethyl, phenyl and substituted phenyl; (vi) phenoxy; and (vii) substituted phenoxy wherein the substituents are selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen, trifluoromethyl, phenyl and substituted phenyl; (vi) phenoxy; and (vii) substituted phenoxy wherein the substituents are selected from the group consisting of C_1–C_{20} alkyl, C_1–C_{20} alkoxy, halogen, trifluoromethyl, phenyl and substituted phenyl; (b) Q is selected from the group consisting of



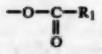
wherein R_1 is selected from the group consisting of (i) hydrogen; (ii) C_1–C_4 alkyl; (iii) C_1–C_4 alkoxy; and (iv) C_1–C_4 alkylamino and wherein R_3 is C_1–C_4 alkyl, with the provisos: (i) when Q is



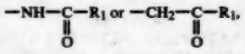
X is C_1–C_{24} alkoxy or



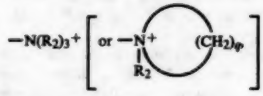
(ii) Q is not



if at the same time R_1 is C_1–C_4 alkyl, X is C_1–C_{24} alkoxy and Y is oxygen; (iii) Q is not —OR_3 if at the same time X is C_1–C_{24} alkoxy and Y is oxygen; (iv) if Q is



then R_1 is C_1–C_4 alkyl; (c) Y is oxygen or CH_2; (d) p is an integer from 1 to 15 with the proviso that when Y is oxygen, p must be greater than 1; and (e) Z is



wherein R_2 is hydrogen or C_1–C_4 alkyl.

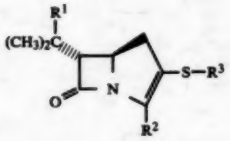
4,640,914
Patent Not Issued For This Number

4,640,915
1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID DERIVATIVES

Masashi Hashimoto, Takarazuka; Matsuhiko Aratani, Daito, and Kozo Sawada, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 18, 1983, Ser. No. 476,860
Claims priority, application United Kingdom, Mar. 29, 1982, 8209156; Oct. 18, 1982, 8229675
Int. Cl.[4] **C07D** *487/04;* **A61K** *31/40*
U.S. Cl. 514—210 **4 Claims**

1. A compound of the formula



(I)

in which R^1 is hydroxy, a protected hydroxy or lower alkoxy group, R^2 is carboxy or an easily eliminable esterified carboxy and R^3 is pyridyl and pharmaceutically acceptable salts thereof.

4,640,916

1,4-BENZOTHIAZINE DERIVATIVES, COMPOSITIONS CONTAINING THEM AND METHOD OF USE

Kanji Meguro, Nishinomiya, and Kohei Nishikawa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

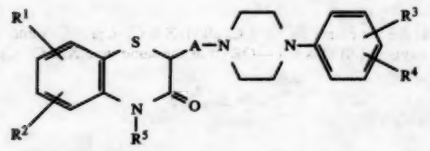
Filed Nov. 27, 1985, Ser. No. 803,217

Claims priority, application PCT Int'l Appl., Nov. 28, 1984, PCT/84/566; Apr. 16, 1985, PCT/85/204

Int. Cl.[4] C07D 417/06; A61K 31/54

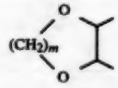
U.S. Cl. 514—222 13 Claims

1. A 1,4-benzothiazine derivative of the formula;



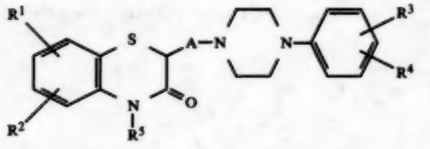
wherein R^1 and R^2 independently stand for hydrogen, halogen, a lower alkyl group, a lower alkoxy group or trifluoromethyl group, or R^1 and R^2, taken together, form a 5–7 membered ring represented by

wherein n is an integer of 3 to 5 or a 5–6 membered ring represented by



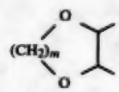
wherein m is 1 or 2, R^3 and R^4 independently stand for hydrogen, halogen, a lower alkyl group, a lower alkoxy group or trifluoromethyl group, R^5 stands for hydrogen or a lower alkyl group, and A stands for an alkylene group or a pharmaceutically acceptable salt thereof.

13. A method for prevention or treatment of hypertension or ischemic cardiovascular disease which comprises administering to a patient an effective amount of a 1,4-benzothiazine derivative or a pharmaceutically acceptable salt thereof of the formula:



R^1 and R^2 independently stand for hydrogen, halogen, a lower alkyl group, a lower alkoxy group or trifluoromethyl group, or R^1 and R^2, taken together, form a 5–7 membered ring represented by

wherein n is an integer of 3 to 5 or a 5–6 membered ring represented by



wherein m is 1 or 2, R^3 and R^4 independently stand for hydrogen, halogen, a lower alkyl group, a lower alkoxy group or trifluoromethyl group, R^5 stands for hydrogen or a lower alkyl group, and A stands for an alkylene group.

4,640,917

2-PHENYL-HEXAHYDRO-1,2,4-TRIAZINE-3,5-DIONES

Manfred Rösner, Eppstein, and Wolfgang Raether, Dreieich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

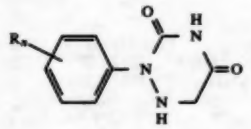
Filed Mar. 8, 1985, Ser. No. 709,798

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1984, 3408924

Int. Cl.[4] C07D 253/06; A61K 31/53, 31/535, 31/54

U.S. Cl. 514—222 6 Claims

1. A substituted 2-phenyl-hexahydro-1,2,4-triazine-3,5-dione of the formula



(I)

in which n is one, two or three and the individual substituents R are independently of one another (a) hydrogen, fluorine, chlorine, bromine, iodine, trifluoromethyl, alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl each having 1 to 6 carbon atoms in the alkyl moiety, nitro, cyano, amino, alkylamino or dialkylamino each having 1 to 12 carbon atoms in the alkyl moiety, piperidino, morpholino, thiomorpholino, 1-pyrrolidinyl, 4-methyl-1-piperazinyl or acylamino having 1 to 6 carbon atoms in the acyl moiety, or (b) a phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzoyl, benzoylamino or aniline radical which is in each case $R_{(o)}$-substituted, and the alkali metal salts, alkaline earth metal salts or ammonium salts thereof.

6. A process for controlling protozoal diseases, in particular coccidiosis, which comprises administering to an animal a fodder which contains an active compound of the formula I as claimed in claim 1, in a concentration of 0.1–300 ppm, preferably 0.5–50 ppm.

4,640,918

SUBSTITUTED 2-PHENYL-1,3-DIOXOLANES

Ivan Kompis, Oberwil, Switzerland, and Ekkehard Weiss, Inzlingen, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

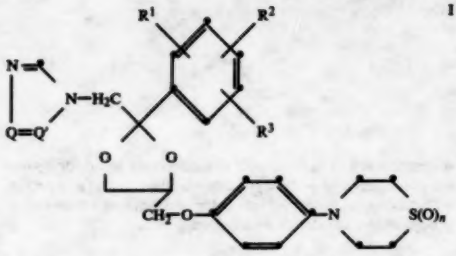
Filed Aug. 12, 1985, Ser. No. 764,370

Claims priority, application Switzerland, Aug. 31, 1984, 4177/84

Int. Cl.[4] A01N 31/54; C07D 417/14

U.S. Cl. 514—222 11 Claims

1. A compound of the formula



I

wherein one of the symbols Q and Q' is the group —CH= and the other is the group —CH= or —N=, R^1, R^2 and R^3 each independently is hydrogen or halogen and n is the integer 0, 1 or 2,

or its pharmaceutically acceptable acid addition salt.

4,640,919

3-SUBSTITUTED CARBACEPEM COMPOUNDS HAVING ANTIBACTERIAL EFFECT

Kenichi Mochida, Hiratsuka; Takehiro Ogass; Junichi Shimada, both of Machida; Tadashi Hirata, Yokohama; Kiyoshi Sato, Mishima, and Ryo Okachi, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

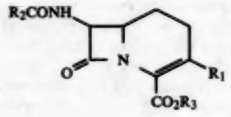
Filed Feb. 19, 1985, Ser. No. 702,623

Claims priority, application Japan, Feb. 21, 1984, 59-30988

Int. Cl.[4] A61K *31/53;* **C07D** *251/00, 253/00*

U.S. Cl. 514—241 **3 Claims**

1. A carbacephem compound represented by the formula:

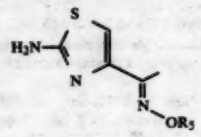


wherein:

R_1 is unsubstituted or substituted heterocyclicthio group, wherein the heterocyclic group is apyridyl, tetrazolyl, thiazolyl, thiadiazolyl, oxazolyl, triazolyl, pyrimidyl, imdazolyl or triazinyl group, and the substituent on these heterocycles is an alkyl group having 1 to 6 carbon atoms, hydroxyl, amino, nitro or $—(CH_2)_n$ Y group, wherein Y is a hydroxyl, carboxyl or sulfo group, and n is an integer of 1 to 4;

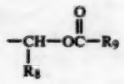
R_2 is a group represented by the formula:

wherein R_4 is a phenyl group optionally substituted with an alkyl group having 1 to 6 carbon atoms, hydroxyl, amino, nitro or carboxyl group, or 2-aminothaizolyl group, or a group represented by the formula:

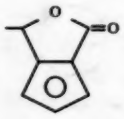


wherein R_5 is an alkyl group having 1 to 7 carbon atoms optionally substituted with a hydroxyl, carboxyl or sulfo group;

R_3 is hydrogen, an alkali metal, an alkaline earth metal, an ammonium group of a basic amino acid, a group represented by the formula:



where R_8 is hydrogen or an alkyl group having 1 to 6 carbon atoms, and R_9 is an alkyl group having 1 to 6 carbon atoms or phenyl group, or a group represented by the formula:



3. An antibacterial composition comprising, as an active ingredient, an effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4,640,920

4-(CINNOLINYLAMINO OR QUINAZOLINYLAMINO)BENZENESULPHONAMIDES AND INTERMEDIATES THEREFOR

John T. A. Boyle, Cookham, and Richard S. Todd, Burnham, Near Slough, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

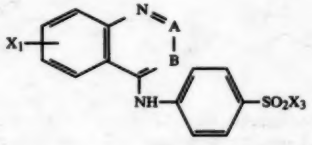
Filed Jun. 13, 1985, Ser. No. 744,364

Claims priority, application United Kingdom, Jun. 14, 1984, 8415174; Dec. 19, 1984, 8432091

Int. Cl.[4] A61K *31/505, 31/50;* **C07D** *471/02, 211/14*

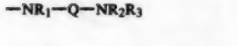
U.S. Cl. 514—248 **14 Claims**

1. A compound selected from those having the formula I



(I)

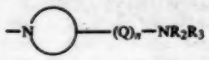
and their pharmaceutically acceptable salts, wherein one of A and B is CH whilst the other one of A and B is N; X_1 is selected from halogen and trifluoromethyl and X_3 is a group having one of the formulae II, III, IV



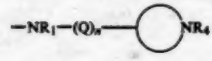
(II)

-continued

(III)



(IV)



(V)

wherein Q is lower alkylene; R_1 is hydrogen or lower alkyl; R_2 and R_3, when separate, are independently lower alkyl and R_2 and R_3, when linked together, represent a divalent radical such that HNR_2R_3 is a secondary cyclic amine with 5 to 7 ring atoms; R_4 is lower alkyl; n is selected from 0 and 1; the ring illustrated in formulae III and IV is selected from the group consisting of piperidine, pyrrolidine, piperidine substituted on at least one ring carbon atom by lower alkyl and pyrrolidine substituted on at least one ring carbon atom by lower alkyl and the ring illustrated in formula V is selected from piperazine and piperazine substituted on at least one ring carbon atom by lower alkyl.

14. A pharmaceutical composition comprising an anti-hypertensively effective amount of a compound as claimed in claim 1 in association or combination with a pharmaceutically acceptable carrier.

4,640,921

TREATMENT OF SEXUAL DYSFUNCTION WITH BUSPIRONE

Ekkehard Othmer, and Sieglinde C. Othmer, both of Overland Park, Kans., assignors to Bristol-Myers, New York, N.Y.

Filed Feb. 4, 1986, Ser. No. 825,826

Int. Cl.[4] A61K *31/50, 31/495*

U.S. Cl. 514—252 **8 Claims**

1. A method for treating sexual dysfunction which comprises administering a non-toxic therapeutically effective dose of buspirone or a pharmaceutically acceptable acid addition salt thereof to a patient in need of such treatment.

4,640,922

3N-SUBSTITUTED 3,4-DIHYDROPYRIMIDINES AS AGENTS FOR TREATING DISORDERS OF CARDIOVASCULAR SYSTEM

Hidetsura Cho, Ibaraki; Kazuo Aisaka, Mishima, and Mariko Emon, Matsudo, all of Japan, assignors to Suntory Limited, Osaka, Japan

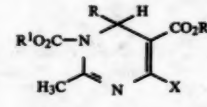
Filed Mar. 6, 1985, Ser. No. 708,887

Claims priority, application Japan, Mar. 8, 1984, 59-44729

Int. Cl.[4] A61K *31/505*; C07D *239/02*

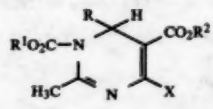
U.S. Cl. 514—256 **4 Claims**

1. A 3N-substituted 3,4-dihydropyrimidine compound of the formula:



wherein R^1 is methyl or ethyl, R^2 is methyl or ethyl, R is phenyl, nitrophenyl, (C_1–C_2) alkylthiophenyl, chlorophenyl, bromophenyl, fluorophenyl, dichlorophenyl or trifluoromethyl, X is chloro or methyl and pharmaceutically acceptable acid addition salts thereof.

4. A method for treating disorders of the cardiovascular system in a mammal comprising administering an effective amount of a 3N-substituted 3,4-dihydropyrimidine derivative of the formula:



wherein R^1 is methyl or ethyl, R^2 is methyl or ethyl, R is phenyl, nitrophenyl, (C_1–C_3) alkylthiophenyl, chlorophenyl, bromophenyl, fluorophenyl, dichlorophenyl, or trifluoromethyl, X is chloro or methyl or a pharmaceutically acceptable acid addition salt thereof; and

a pharmaceutically acceptable carrier.

4,640,923

METHODS OF COMBATTING FUNGI EMPLOYING 2,4-DIAMINO-6-HALOGENO-5-ALKYLTHIO-PYRIMIDINES

Michael Schwambora, Cologne; Engelbert Kühle, Bergisch-Gladbach; Erich Klauke, Odenthal; Ludwig Eue, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach; Hans-Joachim Santel, Cologne, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

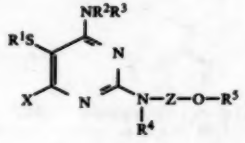
Division of Ser. No. 730,939, May 3, 1985. This application Jan. 8, 1986, Ser. No. 816,936

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417264

Int. Cl.[4] A01N *43/54*

U.S. Cl. 514—272 **6 Claims**

1. A method of combating fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of 2-,4-diamino-6-halogeno-5-alkylthiopyrimidine of the formula



wherein

X is halogen,

R^1 is alkyl which has 1 to 6 C atoms and which is optionally substituted by halogen,

R^2 is hydrogen or alkyl with 1 to 6 C atoms,

R^3 is hydrogen, alkyl or alkoxyalkyl with 1 to 6 C atoms in each alkyl moiety,

R^4 is hydrogen or alkyl with 1 to 6 C atoms,

Z is a branched or straight-chain alkylene group with 2 to 10 C atoms, and

R^5 is alkyl with 1 to 6 C atoms.

4,640,924

THIENOQUINOLIZINES AND THEIR USE AS α_2-ADRENOCEPTOR ANTAGONISTS

Alan C. White, Englefield Green; Robin G. Shepherd, Maidenhead, and Barry J. Langham, Slough, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

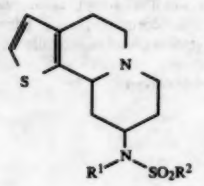
Filed Aug. 12, 1985, Ser. No. 764,904

Claims priority, application United Kingdom, Aug. 14, 1984, 8420602

Int. Cl.[4] A61K *31/38*; C07D *455/04*

U.S. Cl. 514—291 5 Claims

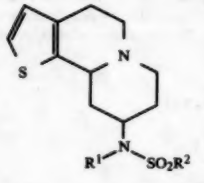
1. A compound selected from the group consisting of a thienoquinolizine of the formula



(I)

and a pharmaceutically acceptable acid addition salt thereof, where R^1 is $-A^1NR^5.SO_2R^6$ (where A^1 is a lower alkylene group having 1 to 3 carbon atoms in the chain between the two N atoms, R^5 is hydrogen or lower alkyl and R^6 is lower alkyl, halo(lower)alkyl, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, loweralkylenedioxy, nitro, amino, loweralkylcarbonylamino, lower alkylamino, diloweralkylamino or trifluoromethyl) and R^2 is lower alkyl, halo(lower-)alkyl, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, lower alkylenedioxy, nitro, amino, loweralkylcarbonylamino, lower alkylamino, diloweralkylamino or trifluoromethyl.

5. A method of antagonising α_2 adrenoceptors in warm blooded animals which comprises administering to the animal an amount sufficient to antagonise α_2 adrenoceptors of a compound selected from the group consisting of a thienoquinolizine of the formula



and a pharmaceutically acceptable acid addition salt thereof, where R^1 is $-A^1NR^5.SO_2R^6$ (wherein A^1 is a lower alkylene group having 1 to 3 carbon atoms in the chain between the two N atoms, R^5 is hydrogen or lower alkyl and R^6 is lower alkyl, halo(lower)alkyl, phenyl or phenyl substituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, loweralkylenedioxy, nitro, amino, loweralkylcarbonylamino, lower alkylamino, diloweralkylamino or trifluoromethyl) and R^2 is lower alkyl, halo(lower-)alkyl, phenyl or phenyl suhstituted by one or more substituents selected from the group consisting of halogen, lower alkoxy, lower alkyl, loweralkylenedioxy, nitro, amino, loweralkylcarbonylamino, lower alkylamino, diloweralkylamino or trifluoromethyl.

4,640,925

DIPHENYLMETHYLENE PIPERIDINES, COMPOSITIONS AND USE

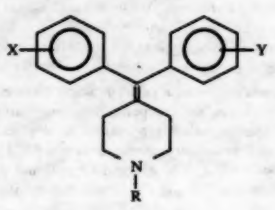
David A. Downs, and Haile Tecle, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 734,432, May 16, 1985, Pat. No. 4,584,301, which is a division of Ser. No. 500,344, Jun. 2, 1983, Pat. No. 4,540,780. This application Feb. 11, 1986, Ser. No. 828,377

Int. Cl.[4] A61K *31/445*; C07D *211/70*

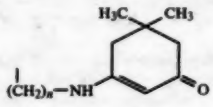
U.S. Cl. 514—331 6 Claims

1. Diphenylmethylene piperidine compounds having in free base form the structural formula I:



I

where R has the structural formula



Id

and where X and Y, which can be the same or different, are H, halogen, halomethyl, alkyl or alkoxy; n is 2, 3 or 4; and pharmaceutically acceptable salts thereof.

3. A pharmaceutical composition comprising a compound according to claim 1, in combination with a pharmaceutically acceptable carrier.

4,640,926

3,5-SUBSTITUTED-2-PYRIDYLALKYLAMINO-THIADIAZOLES HAVING HISTAMINE H_1-ANTAGONIST ACTIVITY

George S. Sach, Welwyn, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

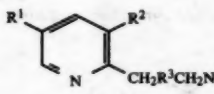
Division of Ser. No. 559,520, Dec. 9, 1983. This application May 17, 1985, Ser. No. 735,011

Claims priority, application United Kingdom, Dec. 14, 1982, 8235590; Aug. 19, 1983, 8322347

Int. Cl.[4] C07D *417/12*; A61K *31/44*

U.S. Cl. 514—333 12 Claims

1. A compound of formula (1)



(I)

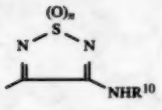
or a pharmaceutically acceptable salt thereof; where

R^1 is halogen, nitro, amino, C_{1-4} alkylamino, C_{1-4} alkanoylamino or C_{1-4} alkyl;

R^2 is halogen, nitro, amino, C_{1-4}alkylamino, C_{1-4} alkanoylamino, C_{1-4} alkyl, or C_{3-4} alkoxy;

R^3 is a C_{1-3} alkylene group; and

R^4 is a group of formula (5):



(5)

where n is 0, 1 or 2

R^{10} is hydrogen, C_{1-6} alkyl, or optionally substituted phenyl or phenyl(C_{1-6})alkyl (the substituents being one or two C_{1-6} alkyl, or C_{1-6} alkoxy groups or halogen atoms or a methylenedioxy group); or optionally substituted pyridyl or pyridyl (C_{1-6}) alkyl where the optional substituent is one C_{1-6} alkyl or C_{1-6} alkoxy group or halogen atom.

12. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,640,927

SUBSTITUTED OXIME CARBAMATES

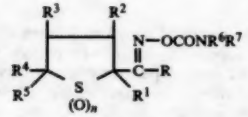
Richard J. Strunk, Cheshire, and Richard C. Moore, Wallingford; both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 595,156, Mar. 30, 1984, abandoned. This application Jun. 4, 1984, Ser. No. 616,994

Int. Cl.⁴ A01N *43/02;* **C07D** *401/00, 333/22*

U.S. Cl. 514—342 **12 Claims**

1. A compound or salt thereof having the structural formula



where R is C_1–C_4 alkyl, cyclopropyl, C_2–C_4 alkoxyalkyl, C_2–C_4 alkylthioalkyl, C_4–C_8 dialkylaminoalkyl, C_2–C_4 alkylsulfinylalkyl, C_2–C_4 alkylsulfonylalkyl, phenyl, C_7–C_9 aralkyl, C_7–C_9 alkaryl, furyl, thienyl or pyridyl; R^1 is hydrogen, halo or C_1–C_4 alkyl; R^2, R^3, R^4 and R^5 are the same or different and are C_1–C_4alkyl or hydrogen; R^6 and R^7 are the same or different and are hydrogen, C_1–C_4 alkyl, allyl, benzyl or tolyl, with the proviso that both R^6 and R^7 are not hydrogen; and n is 0, 1 or 2.

4,640,928

4-(2-HYDROXY-1-PYRROLIDINYL AND 1-PIPERIDINYL)-2H-BENZO[B]-PYRAN-3-OL DERIVATIVES

Kenneth Willcocks, Old Harlow, England, assignor to Beecham Group p.l.c., England

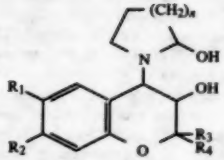
Continuation-in-part of Ser. No. 489,248, Apr. 27, 1983, abandoned. This application Oct. 1, 1985, Ser. No. 782,508

Claims priority, application United Kingdom, Apr. 28, 1982, 8212359; Zambia, Sep. 15, 1982, 76/82; United Kingdom, Sep. 21, 1982, 8226914

Int. Cl.⁴ C07D *405/04;* **A61K** *31/35*

U.S. Cl. 514—422 **8 Claims**

1. A compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, benzoyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or —$C(C_{1-6}$ alkyl)NOH or —$C(C_{1-6}$ alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

the azacycle and OH moieties are trans; and n is 1 or 2; or when one or other other of R_1 and R_2 is an amino or an amino-containing group, a pharmaceutically acceptable salt thereof.

4,640,929

INSECTICIDALLY, ACARICIDALLY, AND NEMATOCIDALLY 2-AMINO-1,3-DITHIANE DERIVATIVES AND PESTICIDAL COMPOSITIONS THEREFOR

Hiroyuki Mitsudera; Kazuo Konishi, both of Osaka, and Yasuo Sato, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

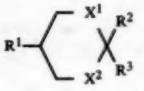
Filed Aug. 23, 1983, Ser. No. 525,635

Claims priority, application Japan, Aug. 27, 1982, 57-149633

Int. Cl.⁴ A61K *31/38;* **C07D** *339/00, 409/00*

U.S. Cl. 514—436 **12 Claims**

1. A 1,3-dithiane compound of the formula



wherein

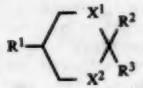
R^1 is a di-substituted amino group of the class consisting of di-C_{1-4}-alkylamino, morpholino, pyrrolidino and N(C_{1-4}-alkyl)CN; Groups R^2 and R^3 are such that one of these groups is an electron-withdrawing group of the class consisting of cyano, nitro, carboxyl, a C_{1-10}-alkoxycarbonyl, C_{6-10}-arylsulfonyl, carbamoyl, mono- or di-C_{1-15}-alkylaminocarbonyl, amino-C_{1-4}alkylaminocarbonyl, C_{2-4} alkenylaminocarbonyl, hydroxy-C_{1-4}-alkylaminocarbonyl, di-C_{1-4}-alkylaminomethyleneaminocarbonyl, C_{3-6}-cycloalkylaminocarbonyl, piperazinocarbonyl, morpholinocarbonyl, pyrrolidinocarbonyl, N-methylpiperazinocarbonyl, C_{6-10}-arylaminocarbonyl which may be substituted with C_{1-4}-alkyl or halogen, C_{1-4}-alkylaminocarbonylaminocarbonyl, hydroxy-C_{1-4}-alkoxy-C_{1-4}-alkylaminocarbonyl, C_{1-4}-alkylcarbonyl, C_{1-4}-alkylcarbonyl, C_{6-10}-arylarbonyl, di-C_{1-4}-alkoxyphosphoryl

and di-C_{6-10}-aryloxyphosphoryl group and the other group which R_2 and R_3 represent is a hydrogen atom, a hydrocarbon group of the class consisting of a C_{1-15}-alkyl, C_{3-6}-cycloalkyl, C_{2-4}-alkenyl, C_{3-6}-cycloalkenyl, C_{6-10}-aryl and phenyl-C_{1-3}-alkyl groups, or a heterocyclic group of the class consisting of thienyl, triazolyl, and pyridyl, said hydrocarbon or heterocyclic groups being optionally substituted byamino, hydroxy, cyano, carbamoyl, carboxyl, sulfo, halo, trifluoromethyl, methylenedioxy, C_{1-4}-alkoxy, hydroxy-C_{1-4}-alkoxy, phenoxy, benzoyl, halobenzoylaminocarbonylamino or halophenylaminocarboxylamino groups;

X^1 is —S— or —SO—;

X^2 is —S—; or a salt thereof.

10. A pesticidal composition which contains in a carrier an insecticidally, acaridically or nematocidally effective amount of a 1,3-dithiane compound of the formula



wherein

R^1 is a di-substituted amino group of the class consisting of d-C_{1-4}-alkylamino, morpholino, pyrrolidino and N(C_{1-4}-alkyl CN; R^2 and R^3 are such that one of them is an electron-withdrawing group of the class consisting of cyano, nitro, carboxyl, a C_{1-10}-alkoxycarbonyl, C_{6-10}-arylsulfonyl, carbamoyl, mono- or di-C_{1-15}-alkylaminocarbonyl, amino-C_{1-4}-alkylaminocarbonyl, C_{2-4} alkenylaminocarbonyl, hydroxy-C_{1-4}-alkylaminocarbonyl, di-C_{1-4}-alkylaminomethyleneaminocarbonyl, C_{3-6}-cycloalkylamino-carbonyl, piperazinocarbonyl, morpholinocarbonyl, pyrrolidinocarbonyl, N-methylpiperazinocarbonyl, C_{6-10}-arylaminocarbonyl which may be substituted with C_{1-4}-alkyl or halogen, C_{1-4}-alkylaminocarbonylaminocarbonyl, hydroxy-C_{1-4}-alkoxy-C_{1-4}-alkylaminocarbonyl, C_{1-4}-alkylcarbonyl, C_{1-4}-alkylcarbonyl, C_{6-10}-arylarbonyl, di-C_{1-4}-alkoxyphosphoryland di-C_{6-10}-aryloxyphosphoryl group and the other group which R_2 and R_3 represent is a hydrogen atom, a hydrocarbon group of the class consisting of a C_{1-15}-alkyl, C_{3-6}-cycloalkyl, C_{2-4}-alkenyl, C_{3-6}-cycloalkenyl, C_{6-10}-aryl and phenyl-C_{1-3}-alkyl group, or a heterocyclic group of the class consisting of thienyl, triazolyl, and pyridyl, said hydrocarbon or heterocyclic groups being optionally substituted bynitro, amino, hydroxy, cyano, carbamoyl, carboxyl, sulfo, halo, trifluoromethyl, methylenedioxy, C_{1-4}-alkoxy, hydroxy-C_{1-4}-alkoxy, phenoxy, benzoyl, halobenzoylaminocarbonylamino or halophenylaminocarboxylamino group;

X^1 is —S— or —SO—;

X^2 is —S—, or a salt thereof.

4,640,930

NAPHTHO(1,8-BC)-1,5-THIAZOCINONES

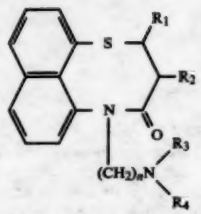
Erno Mohacsi, Summit, and Jay P. O'Brien, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 24, 1986, Ser. No. 843,317

Int. Cl.[4] A61K *31/55*; C07D *281/18*

U.S. Cl. 514—431 **33 Claims**

1. A compound of the formula

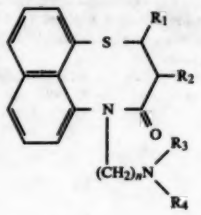


I

wherein R_1 is phenyl substituted with 1 to 3 lower alkoxy groups or 1 to 3 halogens; R_2 is hydroxy or lower alkanoyloxy; R_3 and R_4 are independently lower alkyl or together form a pyrrolidine or piperidine ring, and n is 2 to 4;

or a pharmaceutically acceptable acid addition salt thereof.

28. A method of inducing calcium channel blockage, which comprises administering to a warm-blooded animal in need of such treatment, an effective amount of a compound of the formula



I

wherein R_1 is phenyl substituted with 1 to 3 lower alkoxy groups or 1 to 3 halogens; R_2 is hydroxy or lower alkanoyloxy; R_3 and R_4 are independently lower alkyl or together form a pyrrolidine or piperidine ring; n is 2 to 4;

or a pharmaceutically acceptable acid addition salt thereof.

4,640,931

3-(INDIAN-5-YLOXY (OR THIO)) CYCLOPENTANECARBOXYLIC ACID ANALOGUES

Katsuhiro Imaki, Kyoto; Tadao Okegawa, Yawata, and Yoshinobu Arai, Osaka, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 29, 1985, Ser. No. 792,399

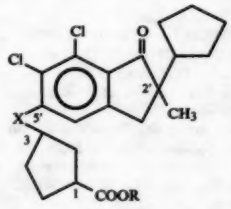
Claims priority, application Japan, Oct. 29, 1984, 59-225818

Int. Cl.[4] C07C *149/40*; A61K *31/215*

U.S. Cl. 514—510 **7 Claims**

1. A 3-(indan-5-yloxy (or thio))cyclopentanecarboxylic acid analogue of the general formula:

(I)



wherein X represents an oxygen atom or a sulfur atom and R represents a hydrogen atom or an alkyl group of 1-4 carbon

atoms; or a non-toxic salt thereof when R represents a hydrogen atom.

4,640,932

COMPOSITIONS FOR TREATING ACNE VULGARIS AND METHODS OF MAKING AND USING SAME

John Fong; Mitchell S. Wortzman, both of Los Angeles, and Richard A. Scott, Burbank, all of Calif., assignors to Neutrogena Corporation, Los Angeles, Calif.

Filed Mar. 18, 1985, Ser. No. 713,211
Int. Cl.[4] A61K *31/075*
U.S. Cl. 514—714 5 Claims

1. A method of producing a facial mask effective for the treatment of acne vulgaris comprising the steps of: forming a slurry containing benzoyl peroxide, an absorbent powder and purified water; grinding said slurry until the particles thereof are 25μ or less; admixing into said slurry sequentially a thickening agent and additional solvent selected from the group consisting of purified water, and mixture of purified water and a lower alkyl alcohol to provide a homogeneous mixture; and collecting said homogeneous mixture into a container.

4,640,933

EXPANDABLE POLYOLEFIN COMPOSITIONS AND PREPARATION PROCESS UTILIZING ISOBUTANE BLOWING AGENT

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 843,422, Mar. 24, 1986, which is a division of Ser. No. 813,315, Dec. 24, 1985. This application May 27, 1986, Ser. No. 868,395
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—94 4 Claims

1. An expanded polyolefin foam comprising an olefin polymer resin selected from the group consisting of ethylene homopolymers and copolymers of ethylene and a copolymerizable monomer, a stability control agent selected from the group consisting of partial esters of long chain fatty acids with polyols, higher alkyl amines, fatty acid amides, and olefinically unsaturated carboxylic acid copolymers, and a blowing agent selected from the group consisting of (i) isobutane, (ii) a mixture of from 5%–95% isobutane on a molar basis with from 95%–5% of a physical blowing agent selected from the group consisting of chlorofluorocarbons and fluorocarbons having from 1 to 4 carbon atoms, boiling points between −50° and 50° C., and a permeation rate through said olefin polymer resin modified with said stability control agent of less than about 1.2 times the permeation rate of air, and (iii) a mixture of at least 70% isobutane with a physical blowing agent selected from the group consisting of hydrocarbons, chlorocarbons, and chlorofluorocarbons having from 1 to 5 carbon atoms, boiling points between −50° C. and 50° C., and a permeation rate through said olefin polymer resin modified with said stability control agent of greater than about 1.2 times the permeation rate of air.

4,640,934

PROCESS FOR THE PREPARATION OF CELLULAR PRODUCTS AND LAMINATES BASED ON FURAN PREPOLYMERS

Pierre Michel, Villa Le Mandala, La Mure, La Terrasse, 38660 Le Touvet, France

PCT No. PCT/FR84/00015, § 371 Date Sep. 24, 1984, § 102(e) Date Sep. 24, 1984, PCT Pub. No. WO84/02914, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 23, 1984, Ser. No. 662,404
Claims priority, application France, Jan. 23, 1983, 83 01151
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—103 7 Claims

1. A process for the preparation of cellular products and laminates based on anhydrous furan prepolymers which possess free OH groups comprising the steps of:

providing a furan prepolymer comprising a combination of a bis-hydroxylmethylfuran resin with a furfuryl alcohol resin or furfural/phenol or bis-phenol A resin at ambient temperature;

providing a catalytic agent by dissolving a cross-linking and expansion agent selected from the group consisting of silicon tetrachloride and phosphorus oxychloride in a solvent selected from the group consisting of trichlorotrifluoroethane, trichlorofluoromethane, pentane, carbon tetrachloride, polytetramethyleneglycol ether, neopentylglycol phosphate, brominated neopentylglycol phosphate, tri-β-chloroethyl phosphate and tri-β-chloropropyl phosphate; and

mixing said furan prepolymer and said catalytic agent in an amount of 0.1 to 5% by weight of said furan prepolymer in the absence of acid at ambient temperature under pressure whereby expansion and curing of the furan prepolymer occurs.

4,640,935

ADDITION POLYMERIZABLE ADDUCTS FOR NONAQUEOUS DISPERSIONS

Thomas E. Fisk, and Dwight K. Hoffman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 448,082, Dec. 9, 1982, Pat. No. 4,588,830. This application May 9, 1985, Ser. No. 732,118
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—137 7 Claims

1. A stable copolymer dispersion comprising

I a polyahl and dispersed therein

II(a) an ethylenic addition copolymerizate of (1) an ethylenic addition polymerizable adduct comprising an ethylenically unsaturated moiety bound through a heteroatomic moiety to at least one lyophilic moiety wherein said adduct in polymerized form is capable of stabilizing a dispersion of a lyophobic polymer in a continuous nonaqueous liquid phase and (2) at least one ethylenically unsaturated monomer other than the adduct ("other monomer"); or

II(b) a mixture of (1) a reaction product of (i) a monoahl or a polyahl and (ii) an addition copolymer of an ethylenic addition polymerizable adduct comprising an ethylenically unsaturated moiety bound through a heteroatomic moiety to at least one lyophilic moiety wherein said adduct in polymerized form is capable of stabilizing a dispersion of a lyophobic polymer in a continuous nonaqueous liquid phase with at least one "other monomer" which is non-reactive with the heteroatomic monomer and the monoahl or polyahl and (2) an ethylenic addition polymer of at least one "other monomer"; or

II(c) a combination of (b) and (c); or

II(d) a combination of (b) and/or (c) and an ethylenic addition polymer of at least one "other monomer", said monoahl or polyahl and adduct being present in reacted form in an amount sufficient to stabilize the dispersion.

4,640,936

PHOTOPOLYMERIZABLE PHOSPHATE-CONTAINING ADHESION PROMOTING DENTAL COMPOSITION

Ralf Janda, Bad Homburg, and Bernhard Eppinger, Wehrheim, both of Fed. Rep. of Germany, assignors to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,385
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414163
Int. Cl.[4] C08F *130/02, 230/02, 2/50;* C08K *5/07*
U.S. Cl. 522—14 14 Claims

1. An adhesion promoting dental composition for use together with a photopolymerizable dental sealing composition consisting essentially of

a solution of (i) 10 to 30% by weight of at least one phosphate selected from the group consisting of methacryloyloxyethyl dihydrogen phosphate and bis-(metha-

cryloyloxyethyl) hydrogen phosphate and (ii) a photopolymerization catalyst comprising camphor quinone and an amine, in acetone.

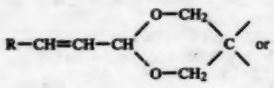
4,640,937

MODIFIED PHENOLIC RESIN COMPOSITION

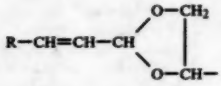
Toshiaki Hanyuda, Yokohama, Japan, assignor to Showa Highpolymer Co. Ltd., Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,523
Int. Cl.[4] C08F 2/46
U.S. Cl. 522—31 4 Claims

1. A modified phenolic resinous composition curable with active energy rays comprising at least one phenolic compound selected from the group consisting of substituted or unsubstituted mononuclear phenol, bisnuclear phenol linked through a linking group, phenolic novolacs, and polyvinylphenols, at least one compound containing in one molecule at least two unsaturated cycloacetal radicals having the formula:



or



wherein R represents hydrogen or a methyl group, and an onium salt selected from the group consisting of salts of diarylhalonium, triarylsulfonium and triarylselenium with tetraflourinated boron, hexafluorinated arsenic, hexafluorinated phosphorus, and hexafluorinated antimony.

4,640,938

RADIATION-CURABLE COMPOSITION, A PROCESS FOR PREPARING SAME, AND THE USE THEREOF

Manfred Römer, Stuhr; Peter Woletz, and Klaus Kruger, both of Bremen, all of Fed. Rep. of Germany, assignors to Morton Thiokol GmbH, Fed. Rep. of Germany

Filed Oct. 23, 1984, Ser. No. 664,120
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1983, 3339485
Int. Cl.[4] C08F 8/00
U.S. Cl. 522—79 10 Claims

1. A process for curing a high-energy radiation curable composition, which can be carried out without any protective sheathing in the presence of atmospheric oxygen, comprising the steps of:

A. forming a homogeneous admixture of a radiation curable composition consisting essentially of ingredients selected from the group consisting of acrylate or methacrylate based monomers, oligomers and polymers with a waxy material selected from the group consisting of:

i. natural waxes other than paraffin;

ii. solvent extraction products of natural waxes other than paraffin;

iii. alcohols of natural waxes other than paraffin;

iv. esters of natural waxes other than paraffin;

v. carboxylic acids of natural waxes other than paraffin; and

vi. mixtures thereof; and

B. exposing said homogeneous admixture to radiation, thereby curing said radiation curable composition while said admixture remains homogeneous.

4,640,939

ORGANOPOLYSILOXANE COMPOSITIONS FOR ANTIADHESIVE/RELEASE COATINGS

Jacques Cavezzan, Villeurbanne, and Gerard Soula, Meyzieu, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Oct. 15, 1985, Ser. No. 787,065
Claims priority, application France, Oct. 15, 1984, 84 15745
Int. Cl.[4] C08F 2/46
U.S. Cl. 522—99 17 Claims

1. A curable organopolysiloxane composition of matter, comprising (1) at least one substantially straight-chain organopolysiloxane having a viscosity ranging from about 50 to 100,000 mPa.s at 25° C. and containing at least x alkenyl unsaturated hydrocarbon groups bonded to a silicon atom, per molecule, wherein $x \geqq 2$, (2) at least one organohydropolysiloxane crosslinking agent having a viscosity ranging from about 10 to 100,000 mPa.s at 25° C. and containing at least y hydrogen atoms bonded to silicon atoms, per molecule, wherein $y \geqq 2$, (3) a catalytically effective amount of a platinum group metal crosslinking catalyst, and (4) an effective amount of at least one azodicarboxylate gelation inhibitor which is inert to the activity of said catalyst (3) and which inhibits gel formation at ambient temperatures, but in insufficient amount as to prevent the crosslinking of said polysiloxanes (1) and (2) under cross-linking conditions.

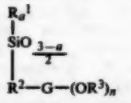
4,640,940

POLYOL TERMINATED SILICONES AND DERIVATIVES THEREOF

Anthony F. Jacobine, Meriden, and David M. Glaser, New Britain, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Aug. 13, 1985, Ser. No. 765,292
Int. Cl.[4] C08F 2/46
U.S. Cl. 522—99 24 Claims

1. A polydiorganosiloxane having at least one repeat unit represented by the formula



I

where R^1 is an organo group; R^2 is alkylene or alkenylene; G is a n+1 valent hydrocarbon, oxyhydrocarbon or poly(oxyhydrocarbon) radical in which some or all of the hydrogen atoms may optionally be substituted by halogen atoms; the R^3 groups are H, groups having epoxy functionality, styryl groups which may be optionally substituted, organic groups having photoinitiator activity, aryl sulfonyl carbamyl groups, mercaptoacetyl groups, mixtures of one or more said groups or mixtures of one or more said groups with one or more groups having (meth)acrylic functionality; n is an integer of 2 or more provided that when n is 2 and one of R^3 is H then the other R^3 group is also H; and a is 0, 1 or 2.

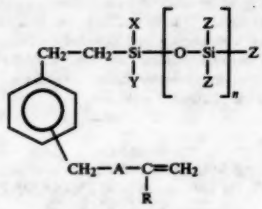
4,640,941

HYDROGELS CONTAINING SILOXANE COMONOMERS

Joonsup Park, and Joseph J. Falcetta, both of Arlington, Tex., assignors to Alcon Laboratories, Fort Worth, Tex.

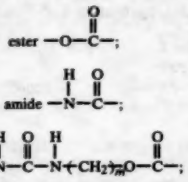
Continuation-in-part of Ser. No. 801,259, Nov. 23, 1985. This application Jan. 7, 1986, Ser. No. 816,766
Int. Cl.[4] A61K 6/10; C08L 43/00, 43/04; C08F 230/08
U.S. Cl. 523—107 21 Claims

1. A hydrogel polymeric material comprising from about 40% to about 95% of hydrogel forming comonomer material, and from about 5% to about 60% by weight of a siloxane monomer having the formula:



where

(1) "A" is selected from the group consisting of:

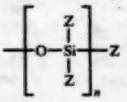


where m is a number and is from 2–4;

(2) R is hydrogen or methyl;

(3) X and Y are selected from the group consisting of C_1 to C_5 alkyl groups, phenyl groups and W groups;

(4) W is a group of the structure



(5) Z is selected from the group consisting of C_1 to C_5 alkyl groups and phenyl groups; and

(6) n is an integer from zero to five.

4,640,942

METHOD OF REDUCING FLUID LOSS IN CEMENT COMPOSITIONS CONTAINING SUBSTANTIAL SALT CONCENTRATIONS

Lance E. Brothers, Ninnekah, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 25, 1985, Ser. No. 780,055

Int. Cl.[4] C09K *7/00*

U.S. Cl. 523—130 **24 Claims**

1. A method of cementing a conduit in a borehole penetrating an earthen formation by introducing a salt-tolerant cementing composition into the space between said conduit and said formation, wherein said cementing composition comprised:

cement;

water containing in excess of about 10% salt by weight of water, and

a fluid loss additive comprising an admixture of (i) a copolymer or copolymer salt of acrylic acid and 2-acrylamido, 2-methyl propane sulfonic acid or acid salt thereof having a mole ratio of from about 1:5 to about 5:1 and a molecular weight also such that a 10% aqueous solution of said copolymer has a Brookfield viscosity reading at 20 rpm of the U.L. Adapter Spindle in the range of between about 5 to about 50 centipoise present in an amount of from about 0.1% to about 3.0% by weight of dry cement and (ii) at least one member selected from the group consisting of carboxymethylhydroxyethylcellulose and a copolymer or copolymer salt of N,N, dimethylacrylamide and 2-acrylamido, 2-methyl propane sulfonic acid or acid salt thereof having a mole ratio from about 1:4 to about 4:1 and a molecular weight also such that a 0.1% aqueous solution of said copolymer has a Brookfield viscosity reading at 5 rpm of the U.L. Adapter Spindle in the range of between about 30 and about 250 centipoise present in an amount of from about 0.1% to about 1.0% by weight of dry cement.

4,640,943

SURFACE MODIFIER FOR INORGANIC SUBSTANCES

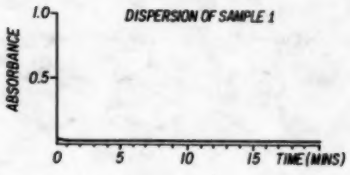
Kenjiro Meguro, Tokyo; Koichiro Sagawa; Hirofumi Yokota, both of Kawasaki, and Masahiro Takehara, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 653,024

Claims priority, application Japan, Sep. 22, 1983, 58-175708; Sep. 22, 1983, 58-175709; Jun. 26, 1984, 59-131781

Int. Cl.[4] C08L *83/00;* **C04B** *14/00;* **A61K** *7/035*

U.S. Cl. 523—200 **16 Claims**



1. An inorganic composition of improved characteristics, comprising:

at least one particulate inorganic substance whose surface is modified by an N-acylated lysine.

4,640,944

INJECTION MOLDABLE POLYAMIDE-IMIDE-PHTHALAMIDE COPOLYMERS CONTAINING POLYETHERIMIDES

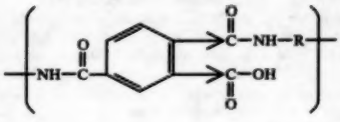
Gary T. Brooks, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 576,137, Jan. 31, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,421

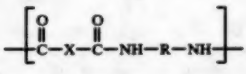
Int. Cl.[4] C08K *9/00;* **C08L** *77/06*

U.S. Cl. 523—205 **20 Claims**

1. As a composition of matter, a blend of a polyetherimide and an amide-imide-phthalamide copolymer comprising as a first component about 10 to about 40 percent by weight of said polyetherimide moiety and as a second component about 90 to about 60 percent by weight of said amide-imide-phthalamide copolymer comprising recurring polyamide A units of:



which are capable of undergoing imidization, and polyamide B units of:



wherein the molar ratio of A units to B units is about 1 to 1, wherein R is a divalent aromatic hydrocarbon radical and

wherein X is a divalent aromatic radical and → denotes isomerization.

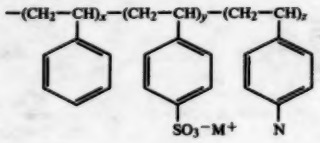
4,640,945

DRAG REDUCTION WITH NOVEL HYDROCARBON SOLUBLE POLYAMPHOLYTES

Dennis G. Peiffer, East Brunswick; Ralph M. Kowalik, and Robert D. Lundberg, both of Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 12, 1985, Ser. No. 796,708
The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.
Int. Cl.[4] C08J 3/00
U.S. Cl. 523—336 4 Claims

1. A method for reducing the frictional drag of an organic liquid in flow through pipes or conduits having a continuous bore therethrough which comprises adding about 0.001 to about 0.5 grams of a polyampholyte to 100 ml of said organic liquid, wherein the polyampholyte has the formula of:



wherein M is a metal cation selected from the group consisting of Group IA, IIA and IB and IIB of the Periodic Table of Elements; x is 50 to about 98 mole percent; y is about 1 to about 50 mole percent; and z is about 1 to about 50 mole percent; wherein y and z are less than 60 mole percent, wherein the sum of x, y and z is 100 mole percent.

4,640,946

POLYVINYL ALCOHOL BASED WAX-FREE SIZE COMPOSITION

Donald A. Vassallo, and David W. Zunker, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 642,435, Aug. 20, 1984, abandoned. This application Aug. 14, 1985, Ser. No. 765,619
Int. Cl.[4] C08J 3/04; C08L 3/00; C07C 43/11
U.S. Cl. 524—45 20 Claims

1. A composition consisting essentially of (a) from about 45.5 to about 99.9% by weight of vinyl alcohol polymer selected from the group consisting of polyvinyl alcohol, vinyl alcohol/-methyl methacrylate copolymer, and polyvinyl alcohol containing solubilizing comonomers other than methyl methacrylate, said vinyl alcohol polymer having a saponification number of from about 1 to about 160 and a 4 percent solution viscosity of from about 3 to about 70 mPa.s at 20° C.:

(b) from about 0.1 to about 3 percent by weight of liquid nonionic low ethylene oxide adduct of branched alcohol or mixture of branched alcohols wherein the average ethylene oxide content is from about 1 to about 7 units and the alcohol has an average carbon content of from about 8 to about 18 carbon atoms;

(c) from 0 to 49.9 percent by weight of starch;

(d) from 0 to about 5 percent by weight of ethylene oxide oligomer having a molecular weight (number average) of from about 200 to about 800 and

(e) from 0 to about 49.9 percent by weight of carboxymethyl cellulose,

(f) from 0 to about 1 percent by weight of at least one auxiliary ethylene oxide adduct selected from the group consisting of low ethylene oxide adduct (containing an average ethylene oxide content of from about 1 to about 7 units) of a linear alcohol or of a mixture of linear alcohols (having an average carbon content of from about 8 to about 18 units) and medium to high ethylene oxide adduct (containing an average ethylene oxide content of from about 3 to about 40 units) of linear or branched alcohols (having an average carbon content of from about 8 to about 18 units) provided that the combined weight of starch and carboxymethyl cellulose does not exceed the weight of vinyl alcohol polymer.

4,640,947

ADHESIVE MEDIUM FOR THE BONDING OF SURFACES IN THE AMMUNITION CONTAINING EXPLOSIVE CHARGES

Günter Berg, Nonnweiler; Otmar Müller, Nohfelden, and Rainer Esters, Solingen, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,670
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420544
Int. Cl.[4] C06B 21/00, 45/22
U.S. Cl. 524—109 5 Claims

1. An adhesive medium for the bonding of surfaces in ammunition containing explosive charges, said adhesive medium comprising:

12 to 30% by weight of a copolymer;

1 to 8% by weight of an oil-free polyester;

1 to 8% by weight of epoxy-modified triglyceride;

6 to 26% by weight of a pigment composition; and

24 to 66% by weight of a polymeric solvent composition, wherein said copolymer consists of approximately 75% vinyl chloride and approximately 25% vinyl monomers.

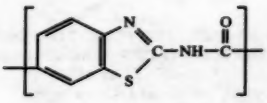
4,640,948

BENZOTHIAZOLE-POLYAMIDE COMPOSITION

Husam A. A. Rasoul, Racine, Wis., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 718,681, Apr. 1, 1985. This application Nov. 12, 1985, Ser. No. 796,715
Int. Cl.[4] C08G 69/08; C08L 77/10
U.S. Cl. 524—157 7 Claims

1. A polyamide which is comprised of a recurring monomeric unit corresponding to the formula:



4,640,949

STABILIZED POLYOXYMETHYLENE COMPOSITIONS

Mark E. Wagman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1985, Ser. No. 736,613
Int. Cl.[4] C08K 5/20; C08L 75/06, 75/04
U.S. Cl. 524—227 19 Claims

1. A stabilized thermoplastic polyoxymethylene composition consisting essentially of:

(a) 40–99.6 weight percent of at least one polyoxymethylene polymer,

(b) at least one stabilizer blend consisting essentially of

(1) 50–97 weight percent based on the total amount of the stabilizer blend of a thermoplastic polyurethane, and

(2) 3–50 weight percent based on the total amount of the stabilizer blend of a polyamide,

wherein the polyamide is dispersed throughout the polyurethane as a separate phase having substantially all of the polyamide particles with a diameter of less than six microns, wherein the quantity of the stabilizer blend is such that the quantity of component (b)(2) polyamide in the

polyoxymethylene composition is 0.2–5.0 weight percent based on the quantity of polyoxymethylene in the composition, and further wherein the melting temperature of the polyamide is above the melting temperature of the polyoxymethylene polymer, and

(c) from a 0 amount to a complemental amount of at least one additive for such polyoxymethylene composition.

4,640,950

THIXOTROPIC POLYURETHANE RESIN COMPOSITIONS

Kenichi Nishino, Ibaraki; Atsuo Kobayashi, Nishinomiya; Sachio Higashi, Suita; Shinichiro Yamamoto, Hikami, and Kiyoshi Yasuda, Ikeda, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 620,051, Jun. 12, 1984, abandoned, and a continuation-in-part of Ser. No. 743,367, Jun. 11, 1985, abandoned. This application Nov. 12, 1985, Ser. No. 797,031

Claims priority, application Japan, Jun. 22, 1983, 58-113383; Jun. 12, 1984, 59-121099

Int. Cl.[4] C08K *3/36*

U.S. Cl. 524—265 **6 Claims**

1. A thixotropic polyurethane resin composition which comprises

(1) a polyurethane prepolymer in the form of liquid or solution,

(2) colloidal silica and

(3) a siloxane compound having a polyoxyethylene chain in the molecule and wherein the proportion of the colloidal silica per 100 parts by weight of the polyurethane prepolymer is 0.5 to 50 parts by weight and the proportion of the siloxane compound per 100 parts by weight of colloidal silica is 0.1 to 50 parts by weight.

4,640,951

METHOD OF MANUFACTURE OF FIBER REINFORCED SILICONE ELASTOMER

Olgerts Skostins, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 12, 1986, Ser. No. 838,842

Int. Cl.[4] C08K *3/36*

U.S. Cl. 524—266 **7 Claims**

1. A method of producing a fiber reinforced silicone elastomer base consisting essentially of

(A) admixing in a high shear mixer,

(1) 100 parts by weight of a polydiorganosiloxane gum,

(2) from 0.1 to 5.0 parts by weight of polydiorganosiloxane plasticizer per 10 parts by weight of filler (4),

(3) chopped organic or inorganic reinforcing fibers, and when the above is uniformly mixed,

(4) from 1 to 60 parts by weight of reinforcing silica filler, and then

(B) optionally adding a small amount of a nitrogen containing catalyst and

(C) heating with mixing under vacuum to treat the filler in situ and remove any volatiles, then

(D) cooling and storing.

4,640,952

PNEUMATIC TIRE HAVING ALL-WEATHER RUNNING PERFORMANCES

Eiji Takiguchi; Kazuaki Yuto, and Toru Oniki, all of Higashikurume, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

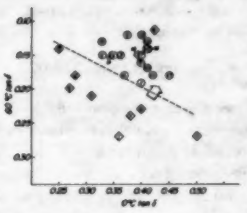
Filed Apr. 10, 1985, Ser. No. 721,725

Claims priority, application Japan, Apr. 10, 1984, 59-69910

Int. Cl.[4] B60C *11/00, 1/00*

U.S. Cl. 524—296 **2 Claims**

1. A pneumatic tire having all-weather running performances, which comprises using in the tread thereof a rubber composition containing 30–80 parts by weight of carbon black having an iodine adsorption value (IA) of not less than 70 mg/g and a dibutyl phthalate (DBP) adsorption of not less than 90 ml/100 g and 2–30 parts by weight of an ester type plasticizer selected from the group consisting of phthalic acid derivatives, fatty acid type monobasic acid esters and fatty acid type dibasic acid esters, based on 100 parts by weight of a rubber blend consisting of 97–10 parts by weight of styrene butadiene rubber having a content of bound styrene of 0–30% and a



content of vinyl bond in the butadiene unit of 25–95% (abbreviated as diene rubber-A hereinafter), 3–30 parts by weight of butyl rubber and/or halogenated butyl rubber, and 0–87 parts by weight of another diene rubber other than said diene rubber-A, wherein said rubber composition has a dynamic storage modulus (E′) at −20° C. of not more than 260 kg/cm^2, a loss tangent (tan δ) at 0° C. of not less than 0.30 and a loss tangent (tan δ) at 60° C. of not more than 0.20.

4,640,953

PRECOAT RESIN DISPERSION FOR TUFTED CARPETS

Raymond W. Goss, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jul. 3, 1984, Ser. No. 627,705

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—476 **9 Claims**

1. A precoat resin dispersion having a solids content from about 63% to about 69% comprising

(a) from about 93% to about 99% by weight of at least one resin material selected from the group consisting of C_5–C_9 hydrocarbon resins, C_5 hydrocarbon resins polyterpene resins and esters of rosin having a Ring and Ball softening point of from about 60° C. to about 100° C. in an aqueous dispersion having a solids content from about 53% to about 58%;

(b) from about 0.5% to about 5%, by weight of the total water content of (a), of at least one water-soluble polymer selected from the group consisting of polyacrylates and cellulose derivatives;

(c) from about 0.1% to about 2.0% of at least one cationic polyamide-epichlorohydrin resin, by weight of the total solids of (a); and

(d) optionally, sufficient water so that the solids content of the precoat resin dispersion is from about 63% to about 69%.

4,640,954

POLYMER SUSPENSION CONTAINING A WATER-SOLUBLE POLYMER SUSPENDED IN AN OIL PHASE

Reiner Schnee, Darmstadt-Arheilgen; Horst Pennewiss, Darmstadt-Neu-Kranichstein, and Gerhard Markert, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 476,050, Mar. 17, 1983, abandoned. This application Feb. 1, 1985, Ser. No. 697,287
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210752
Int. Cl.[4] C08L *39/00*
U.S. Cl. 524—516 11 Claims

1. A polymer suspension comprising

(A) 15 to 60 percent, by weight of said suspension, of a continuous organic phase comprising

(1) an organic liquid which is immiscible or not fully miscible with water, is capable of forming a continuous organic phase in said suspension, and is selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, esters, and chlorinated hydrocarbons, and

(2) 10 to 50 percent, by weight of said organic phase, of a macromolecular emulsifier soluble in said organic liquid and consisting of a mixture of two copolymers, each copolymer being formed from

(a) 10 to 50 percent, by weight of the copolymer, of at least one mono-ethylenically unsaturated free-radically polymerizable vinyl monomer having a basic nitrogen atom and selected from the group consisting of N-vinyl pyridine, vinyl imidazole, dialkylaminoalkyl esters of acrylic acid and of methacrylic acid, and dialkylaminoalkyl amides of acrylic acid and of methacrylic acid, and

(b) 90 to 50 percent, by weight of the copolymer, of at least one ester formed between a monoethylenically unsaturated mono- or dicarboxylic acid and an alkanol having 6–20 carbon atomns, or from (a) and

(c) 90 to 50 percent, by weight of said copolymer, of a mixture of at least one monomer as defined in (b) with at least one vinyl monomer insoluble in water and selected from the group consisting of styrene and lower esters of acrylic and of methacrylic acid,

each of said copolymers being separately prepared by the free radical solution polymerization of a different mixture of monomers (a) and (b) or (a) and (c) as defined above dissolved in the organic liquid forming the continuous phase of said suspension, said different mixtures of monomers comprising different amounts of monomer (a) having a basic nitrogen atom such that (i) the content of basic nitrogen in each of the copolymers formed from said monomer mixtures is from 1.5 to 4.0 percent by weight of basic nitrogen, but (ii) said copolymers differ in their basic nitrogen content by 0.1 to 1.5 percentage points; and

(B) 85 to 40 percent, by weight of said suspension, of an aqueous phase finely divided in said organic phase and comprising

(1) 10 to 50 percent, by weight of said aqueous phase, of water and

(2) 90 to 50 percent, by weight of said aqueous phase of a water soluble copolymer comprising

(a) 20 to 95 percent, by weight of said copolymer, of acrylamide or methacrylamide and

(b) 80 to 5 percent, by weight of said copolymer, of a tertiary ammoniumalkyl ester, quaternary ammoniumalkyl ester, tertiary ammoniumalkyl amide, or quaternary ammoniumalkyl amide of acrylic acid or of methacrylic acid.

4,640,955

TETRAFLUOROETHYLENE FINE POWDER AND PREPARATION THEREOF

Satish C. Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 621,798, Jun. 18, 1984, Pat. No. 4,576,869.
This application Oct. 29, 1985, Ser. No. 794,046
Int. Cl.[4] C08F *14/26*
U.S. Cl. 524—546 2 Claims

1. An aqueous dispersion which contains dispersed particles of polymer, which polymer is a non-melt-fabricable tetrafluoroethylene polymer prepared by the aqueous dispersion polymerization procedure in which the last portion of the polymerization is slowed down by stopping addition of initiator so that the end point is at least 5% longer than if initiator addition is continued to the end of the reaction, characterized in that

(a) the primary particle size is between 0.1 and 0.5 microns;

(b) the standard specific gravity is less than 2.190;

(c) the rheometric pressure is at least 250 kg/cm^2;

(d) the uniformity of strength is at least 75% throughout a lubricant loading range of 4 weight percent which 4 weight percent range is within a lubricant loading level range between 10 and 25 weight percent, at a stretch rate of 100%/second,

(e) the uniformity of stretch is at least 75% throughout a stretch rate of between 10 and 100%/second at a lubricant loading level of 17%, and

(f) the stress relaxation time is at least 400 second.

4,640,956

IODINE RESISTANT SILICONE RUBBER COMPOSITIONS

Melvin R. Toub, and Donald L. Finney, both of Clifton Park, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jun. 13, 1985, Ser. No. 744,848
Int. Cl.[4] C08K *3/22*
U.S. Cl. 524—779 19 Claims

1. In an addition curable silicone composition, the improvement comprising from about 0.25 to about 3 parts by weight per hundred parts by weight of the composition of metallic oxide effective to prevent premature deterioration of the cured composition due to exposure to iodine and/or hydroiodic acid.

4,640,957

POLYIMIDO-ESTER COMPOUNDS AND THERMOSET RESIN COMPOSITIONS CONTAINING SAME

Robert E. Hefner, Jr., and Douglas L. Hunter, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

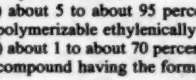
Division of Ser. No. 562,333, Dec. 16, 1983, Pat. No. 4,560,768.
This application Jun. 13, 1985, Ser. No. 744,188
Int. Cl.[4] C08L *67/06, 77/12, 63/10*
U.S. Cl. 525—44 6 Claims

1. A thermosettable resin composition which comprises

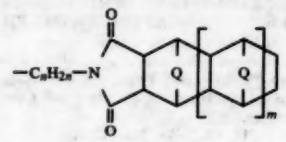
(A) about 5 to about 95 percent by weight based on the total composition weight of at least one resin selected from the group consisting of (a) unsaturated polyester resins, (b) unsaturated polyesteramide resins, (c) dicyclopentadiene modified unsaturated polyester resins, (d) dicyclopentadiene modified unsaturated polyesteramide resins, and (e) vinyl ester resins,

(B) about 5 to about 95 percent by weight of at least one polymerizable ethylenically unsaturated monomer; and

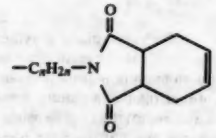
(C) about 1 to about 70 percent by weight of an imido-ester compound having the formula



wherein R is selected fom one of the following groups



(A)



(B)

and R_1 is a divalent radical selected from one of the following groups

I. —C(X)=CH—
II. —CH_2—C(=Y)—
III. —CH=C(Z)—CH_2—

wherein

n=1-6
m=0-10
X=hydrogen or methyl
Y=methylene or isopropylidene
Z=hydrogen or —COOR
Q=methylene.

4,640,958

NOVEL COUPLING AGENT FOR STAR-BLOCK COPOLYMERS

Paul A. Mancinelli, Aston, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 21, 1985, Ser. No. 768,073
Int. Cl.[4] C08F *297/04, 297/02*
U.S. Cl. 525—193 **11 Claims**

1. In a process for the preparation of star-block homopolymers and copolymers of conjugated diene monomers and/or monovinyl aromatic monomers by the solution polymerization of the monomers with 0.2 to 10 millimoles per mole of monomers of a monolithium initiator and then coupling the resultant lithiated homopolymer or copolymer with a coupling agent, the improvement comprising using as the coupling agent acryloyl chloride wherein the ratio of acryloyl chloride to monolithium initiator is between 1 to 1 and 6 to 1.

6. A star-block polymer having 4 to 10 arms attached to a nucleus made up of more than one molecule of acryloyl chloride; said arms being selected from the group consisting of homopolymers of monovinyl aromatic monomers, homopolymers of conjugated diene monomers, copolymers of monovinyl aromatic monomers and conjugated diene monomers, and mixtures of these.

4,640,959

ABS TYPE RESIN HAVING DISPERSE PARTICLES OF A RUBBER EXHIBITING A HIGH SOLUTION VISCOSITY AND A METHOD FOR ITS PREPARATION

Narasaiah Alle, Terneuzen, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 533,038, Sep. 16, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 761,291
Int. Cl.[4] C08F *279/04*
U.S. Cl. 525—316 **16 Claims**

1. A method for preparing a rubber-reinforced copolymer comprising mass polymerizing prior to phase inversion a solution of one or more monvinylidene aromatic compounds, one or more unsaturated nitrile compounds and at least 5 percent of a rubber which exhibits a viscosity, as a 5 weight percent solution in styrene, of at least 120 centipoise, said weight percent being based on the total weight of monomers and rubber, at conditions to form a copolymer of the monovinylidene aromatic compounds or compounds and unsaturated nitrile compound or compounds having a sufficiently high molecular weight such that, upon phase inversion of the mass polymerization mixture and subsequent sizing of the rubber, the rubber becomes dispersed at a volume average particle size of 1.5 micrometer or less without excessively agitating the polymerization mixture and, after phase inversion and sizing of the rubber particles, continuing polymerization to convert the desired amounts of monovinylidene aromatic compound or compounds and unsaturated nitrile compound or compounds to polymer.

4,640,960

DEGRADATION OF POLY(DIACETYLENES)

Reinhold J. Leyrer, Ludwigshafen; Gerhard Wegner, Denzlingen, and Michael Mueller, Waldkirch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,430
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1984, 3346718
Int. Cl.[4] C08C *19/04*
U.S. Cl. 525—388 **17 Claims**

1. A process for reducing the molecular weight of poly(diacetylenes) of the formula $\frac{}{}C(R^1)-C\equiv C-C(R^2)\frac{}{}$ wherein R^1 and R^2 are organic compounds of 1 to 50 carbon atoms comprising preparing an homogeneous mixture of said poly(diacetylene) with a sensitizer which can be activated to form reactive free radicals when treated with chemicals, heat or actinic light, treating said mixture to said activating conditions thereby reducing the molecular weight of said poly(diacetylene).

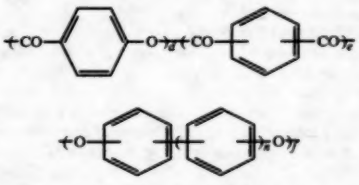
4,640,961

RESIN COMPOSITION

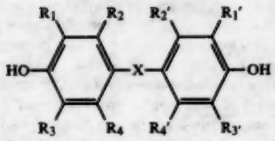
Teruo Saito, Shiga; Kuniaki Asai, Osaka; Yasuro Suzuki, Osaka, and Kei Kagiya, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP85/00014, § 371 Date Jun. 13, 1985, § 102(e) Date Jun. 13, 1985, PCT Pub. No. WO85/03304, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 17, 1985, Ser. No. 748,060
Claims priority, application Japan, Jan. 17, 1984, 59-6948
Int. Cl.[4] C08L *67/02*
U.S. Cl. 525—444 **1 Claim**

1. A resin composition comprising from 60 to 97% by weight of a heat-fusible wholly aromatic copolyester consisting of a copolyester represented by the formula:



wherein d, e, and f are not equal to O and e/f is from 0.90 to 1.10, and n is 0 or 1 and from 3 to 40% by weight of a polyarylate prepared from a mixture consisting of isophthalic acid or a functional derivative thereof and terephathalic acid or a functional derivative thereof and a bisphenol represented by the formula:



wherein —X— is selected from the group consisting of —O—, —SO_2—, —CO—, —S—, an alkylene group, and an alkylidene group, and R_1, R_2, R_3, R_4, R_1', R_2', R_3', and R_4' are each selected from the group consisting of a hydrogen atom, a halogen atom, and a hydrocarbon group.

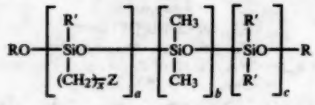
4,640,962

SILICONE-MODIFIED POLYESTER RESIN AND SILICONE-SHEATHED POLYESTER FIBERS MADE THEREFROM

Robert L. Ostrozynski, Williamsville; George H. Greene, Croton-on-Hudson, and James H. Merrifield, Mt. Kisco, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 11, 1985, Ser. No. 774,962
Int. Cl.[4] C08F *283/00*
U.S. Cl. 525—474 **60 Claims**

1. A process for preparing a silicone-modified polyester resin comprising reacting an aromatic dicarboxylic acid or its diester, a diol and a siloxane block polymer of the general formula:



wherein

R is individually a monovalent group selected from the group consisting of alkyl, aryl, acyl, aralkyl and polyoxyalkyl groups;

R′ is individually a monovalent group selected from the group consisting of alkyl, aryl, alkenyl, and aralkyl groups containing from 1 to 8 carbon atoms;

Z is selected from the group consisting of alkyl, aryl, aralkyl, alkoxy, polyoxyalkyl, alkenyl and siloxy with the proviso that when Z is siloxy x must equal zero;

a has a value of 0 to 10;

b has a value of 0 to 50,000;

c has a value of 0 to 1,000 and the sum of a+b+c is such that the siloxane block polymer contains at least 9; silicon atoms; and

x has a value of 0, 1, 2 or 3; wherein said reaction takes place in two stages, the first stage being either a transesterification between the diester of the dicarboxylic acid and the diol and siloxane block polymer or an esterification between the dicarboxylic acid and the diol and siloxane block polymer, the second stage being a polycondensation reaction of the transesterification or esterification product wherein said siloxane block polymer constitutes from 0.1 to 10 weight percent, based on the total reaction product and forms uniform domains approximately 0.05 to 6 micron in average size.

4,640,963

METHOD AND APPARATUS FOR RECYCLE OF ENTRAINED SOLIDS IN OFF-GAS FROM A GAS-PHASE POLYOLEFIN REACTOR

David R. Kreider, Wheaton, Ill.; Albert McCullum, Friendswood, Tex.; Philip M. Rose, Naperville, and Chi-Hung Lin, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 15, 1985, Ser. No. 702,007
Int. Cl.[4] C08F *2/34*
U.S. Cl. 526—67 **14 Claims**

1. In a process for quench-cooled, vapor-phase polymerization of olefin monomer comprising (a) contacting an olefin monomer, or mixture of olefin monomers, with a polymerization catalyst in the presence of hydrogen in a reactor vessel to form polymer product, and (b) removing, condensing and recycling off-gas from such reactor, the improvement comprising separating entrained polymerizing solid fines from said off-gas and recycling such solids directly to the reactor without substantial continued polymerization of such solids while in the presence of a substantially different concentration of hydrogen than in the reactor.

4,640,964

OLEFIN POLYMERIZATION WITH POLYPHOSPHATE SUPPORTED CHROMIUM CATALYSTS

Marvin M. Johnson, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 626,944, Jul. 2, 1984, Pat. No. 4,547,479. This application Jun. 5, 1985, Ser. No. 741,514
Int. Cl.[4] C08F *4/24, 4/78*
U.S. Cl. 526—134 **12 Claims**

1. A polymerization process comprising contacting at least one mono-1-olefin containing 2 to 8 carbon atoms per molecule under polymerization conditions with the catalyst comprising:

a zerovalent organochromium compound on a predominantly aluminum polyphosphate support said zerovalent organochromium compound being present in an amount sufficient to give 0.001 to 10 weight percent chromium based on the weight of said support plus said chromium compound.

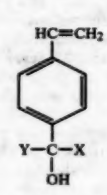
4,640,965

HYDROGEL COMPOSITIONS USING P-(2-HYDROXYHEXAFLUOROISOPROPYL) STYRENE AS A COMONOMER

Joseph J. Falcetta, and Joonsup Park, both of Arlington, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Jan. 7, 1986, Ser. No. 816,768
Int. Cl.[4] C08F *12/20*
U.S. Cl. 526—242 **21 Claims**

1. A hydrogel polymeric material based on copolymers comprising from about 40% to about 95% of a comonomer or comonomers that will form a hydrogel and from about 5% to about 60% by weight of a hydroxyfluoroalkyl styrene monomer of the formula:



wherein X and Y are individually the same or different monovalent fluoroalkyl, each selected from the group consisting of perfluoroalkyl, ω-hydrofluoroalkyl, and ω-chloroperfluoroal-

kyl radicals wherein the alkyl or X and Y is C_1 to C_8, or jointly a divalent perfluoroalkylene radical.

4,640,966

FLUOROOLEFIN COPOLYMER, PROCESS FOR PRODUCTION THEREOF AND COMPOSITION CONTAINING SAID COPOLYMER

Tomomasa Mitani, Izumi, and Ichiro Mihata, Izumiohtsu, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

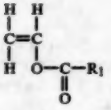
Filed Nov. 5, 1985, Ser. No. 795,115
Claims priority, application Japan, Nov. 7, 1984, 59-234327; Dec. 18, 1984, 59-266831
Int. Cl.[4] C08F 214/24, 214/26, 214/28
U.S. Cl. 526—249 11 Claims

1. A fluoroolefin copolymer having a hydroxyl value of 20 to 200 mg KOH/g and an inherent viscosity of from 0.05 to 2.0 dl/g obtained by copolymerizing

(I) 10 to 70 mole % of a fluoroolefin represented by the general formula

wherein X is H, Cl, F, CF_3, OCF_3 or OC_3F_7,

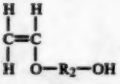
(II) 5 to 60 mole % of a vinyl carboxylate represented by the general formula



wherein R_1 represents an aliphatic, aromatic or alicyclic hydrocarbon group having 1 to 17 carbon atoms,

(III) 5 to 70 mole % of an alkyl vinyl either having an alkyl group with 1 to 8 carbon atoms, and

(IV) up to 30 mole % of a hydroxyl-containing vinyl ether represented by the general formula



wherein R_2 represents an alkylene group having 1 to 6 carbon atoms.

4,640,967

ULTRAVIOLET RADIATION-CURABLE SILICONE RELEASE COMPOSITIONS WITH EPOXY AND/OR ACRYLIC FUNCTIONALITY

Richard P. Eckberg, Round Lake, N.Y., assignor to General Electric Company, N.Y.

Division of Ser. No. 375,676, May 6, 1982, Pat. No. 4,576,999. This application Dec. 18, 1985, Ser. No. 810,484
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—26 9 Claims

1. An organopolysiloxane having both epoxy and acrylic functional units of the formula

where R is hydrogen or $C_{(1-3)}$ alkyl and G is, independently, an epoxy-functional organic radical of from 2 to 20 carbon atoms, or an acrylic-functional organic radical of from 2 to 20 carbon atoms, with at least 1 polymer unit being epoxy-functional and at least 1 polymer unit being acrylic-functional.

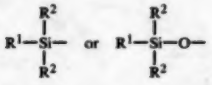
4,640,968

ETHYLIDENE NORBORNYL GROUP-CONTAINING POLYSILOXANE

Junichiro Watanabe; Yuichi Funahashi, both of Ohta; Kazuo Sugiura, and Hironori Matsumoto, both of Tokyo, all of Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Oct. 15, 1985, Ser. No. 787,232
Claims priority, application Japan, Oct. 22, 1984, 59-221539
Int. Cl.[4] C08G 77/20
U.S. Cl. 528—32 6 Claims

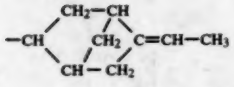
1. An ethylidene norbornyl group-containing polysiloxane, having a molecular weight in the range of 268 to 10,000,000, and possessing a terminal group represented by the formula:



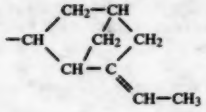
wherein R^1 stands for a substituted or unsubstituted monovalent hydrocarbon group of 1 to 8 carbon atoms, a hydroxyl group, an alkoxy group of 1 to 5 carbon atoms, or at least one of the hydrocarbon groups represented by Y, and each R^2 stands for the same or different groups selected from the class consisting of hydrogen, substituted or unsubstituted monovalent hydrocarbon groups of 1 to 8 carbon atoms, and a terminal group represented by R^1 wherein R^1 has the same meaning as above, and being substantially in the form of a linear chain, 0 to 100 mol%, providing that 100 mol% is excluded where neither of the R^1's in the terminal groups is a hydrocarbon group represented by Y, of the component units being represented by the formula:

wherein each R^3 stands for the same or different groups selected from the class consisting of hydrogen and substituted or unsubstituted monovalent hydrocarbon groups and 100 to 0 mol%, providing that 0 mol% is excluded where neither of the R^1's in the terminal groups is a hydrocarbon group represented by Y, of the component units being represented by the formula:

wherein R^4 stands for a substituted or unsubstituted monovalent hydrocarbon group of 1 to 8 carbon atoms and Y stands for



or



4,640,969

OXAZOLINE/POLYOL/POLYISOCYANATE POLYMERS AND PROCESS

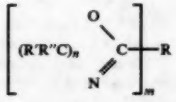
Anil B. Goel, Worthington; Timothy A. Tufts, Columbus, and Peggy A. Blackburn, Plain City, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 7, 1985, Ser. No. 763,107

Int. Cl.[4] C08G *18/30, 18/36*

U.S. Cl. 528—73 **18 Claims**

1. The process consisting essentially of interpolymerizing an oxazoline, a polyol and a polyisocyanate at a temperature in the range of from about 20° C. to about 100° C. at a pressure in the range of from about atmospheric up to about 50 atmospheres wherein the oxazoline is one conforming to the formula



wherein n represents 2 to 3 and m represents 1 or 2 and when m is 1, R represents an alkyl group containing from 1 to 20 carbon atoms and an alkaryl group containing from 7 to 20 carbon atoms; when m is 2, R represents an alkylene group containing from 1 to 19 carbon atoms and R′ and R″ independently represent hydrogen, an alkyl group having from 1 to 10 carbon atoms or an aryl group containing from 6 to 12 carbon atoms.

4,640,970

PROCESS FOR THE PRODUCTION OF POLYAMIDE IMIDES

Wilfried Zecher, Leverkusen; Klaus Reinking, Wermelskirchen, and Frank Kleiner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

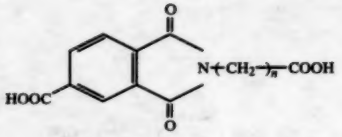
Filed Aug. 21, 1985, Ser. No. 768,102

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431857

Int. Cl.[4] C08G *73/14*

U.S. Cl. 528—73 **7 Claims**

1. A process for the production of polyamide imides which comprises reacting at a temperature of from 0° to 400° C. polyisocyanates, cyclic polycarboxylic acid anhydrides, lactams and trimellitic imidocarboxylic acids of the formula



wherein

n is an interger from 1 to 20.

4,640,971

MICROSPHERICAL PARTICLES OF RESOLE RESINS AND PROCESS FOR PRODUCING THE SAME

Yoshiaki Echigo; Mutsunori Yamao; Yoshiyuki Suematu; Tadashi Ishikura; Keiichi Asami, and Ritsuko Shidei, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Jul. 17, 1985, Ser. No. 755,769

Claims priority, application Japan, Jul. 17, 1984, 59-150399; Nov. 26, 1984, 59-249086

Int. Cl.[4] C08G *8/10, 14/06, 14/08*

U.S. Cl. 528—129 **4 Claims**

1. A resole resin in the form of microspherical particles where the surfaces of the particles are partly or entirely covered with a coating of a substantially water-insoluble inorganic salt having a solubility in water not greater than about 0.2 g/1,000 ml at 25° C. and where the particles have a particle size not larger than about 500 μm.

4,640,972

FILAMENT OF POLYIMIDE FROM PYROMELLITIC ACID DIANHYDRIDE AND 3,4′-OXYDIANILINE

Robert S. Irwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

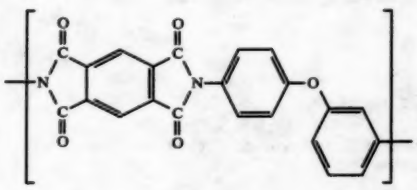
Filed Nov. 15, 1985, Ser. No. 798,512

Int. Cl.[4] C08G *73/10*

U.S. Cl. 528—188 **5 Claims**

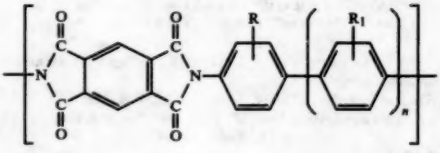
1. A filament consisting essentially of a polyimide of recurring units of the formula

A.



with from 0 to 60 mole %, of units of the formula

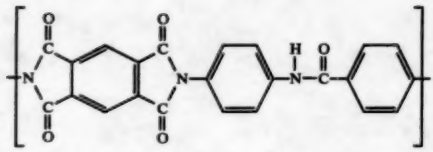
B.



or

-continued

C.



where n is 0 or 1: R and R_1, which may be the same or different are selected from halogen, lower alkoxy, hydrogen or lower alkyl.

4,640,973

POLYAMIDE RESIN CAPABLE OF FORMING CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES FROM PHENYLENE DIOXY DIACETIC ACID AND NAPHTHALENE DICARBOXYLIC ACID

Burns Davis, and Robert B. Barbee, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1985, Ser. No. 785,132

Int. Cl.[4] C08G *69/26*

U.S. Cl. 528—208 **18 Claims**

1. A polyamide composition capable of being formed into molded containers having good gas barrier properties comprising the reaction product of

(A) a diamine containing 2 to about 10 carbon atoms, and

(B) a diacid component comprising

(i) about 25 to 95 mole percent of at least one first diacid selected from the group consisting of 1,4-phenylenedioxy diacetic acid, 1,3-phenylenedioxy diacetic acid and 1,2-phenylenedioxy diacetic acid, and

(ii) 5 to about 75 mole percent of a naphthalene dicarboxylic acid,

wherein said polyamide has an inherent viscosity of about 0.5 to 1.5, measured at 25° C. in a 60/40 by weight mixture of phenol/tetrachloroethane at a concentration of 0.5 g/100 ml.

4,640,974

POLYCYANOARYL ETHER FILMS AND FIBERS

Shigeru Matsuo, and Tomoyoshi Murakami, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

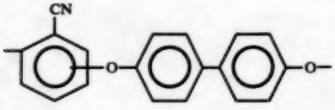
Filed Feb. 18, 1986, Ser. No. 830,652

Claims priority, application Japan, Feb. 22, 1985, 60-32740; Apr. 5, 1985, 60-71209; Apr. 17, 1985, 60-80404; Apr. 23, 1985, 60-85437

Int. Cl.[4] C08G *67/00*

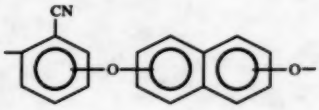
U.S. Cl. 528—211 **15 Claims**

1. A polycyanoaryl ether stretched film which comprises a molded film being composed of (A) a polycyanoaryl ether containing not less than 80 molar % of a repeating unit represented by the formula



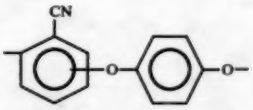
(I)

and having a number-average molecular weight of 25,000–65,000, (B) a polycyanoaryl ether containing not less than 50 molar % of a repeating unit represented by the formula



(I')

and having a reduced viscosity of 0.4–2.0 dl/g at 60° C. in a solution of a concentration of 0.2 g/dl in p-chlorophenol or (C) a polycyanoaryl ether containing not less than 80 molar % of a repeating unit represented by the formula CN



(I")

and having a number-average molecular weight of 30,000–90,000, and having been stretched at a drawing ratio of not less than 1.5 times.

4,640,975

POLYCYANOARYL ETHER AND METHOD OF PREPARING THE SAME

Shigeru Matsuo, and Tomoyoshi Murakami, both of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

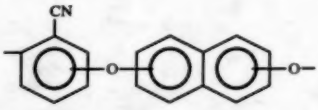
Filed Dec. 26, 1985, Ser. No. 813,620

Claims priority, application Japan, Jan. 10, 1985, 60-1403; Mar. 26, 1985, 60-59466; Apr. 5, 1985, 60-71208

Int. Cl.[4] C08G *65/40*

U.S. Cl. 528—211 **18 Claims**

1. A polycyano aryl ether which has recurring units represented by the formula:



(I)

and has a reduced viscosity of 0.3 dl/g or more at 60° C. in a solution in which the polycyanoaryl ether is dissolved in p-chlorophenol in a concentration of 0.2 g/dl.

4,640,976

PROCESS FOR THE MANUFACTURE OF POLYAMIDE FROM DIAMINE AND DIAMIDE UTILIZING OXYGENATED COMPOUND OF CARBON, BORON, NITROGEN AND SULFUR AS CATALYST

Benedict S. Curatolo, Maple Heights; Robert C. Sentman, Macedonia, and Gerald P. Coffey, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 9, 1985, Ser. No. 763,867

Int. Cl.[4] C08G *69/00, 69/28*

U.S. Cl. 528—336 **17 Claims**

1. A process for the manufacture of a polyamide comprising polymerizing an α,ω-diamine. an α,ω-diamide in contact with a catalyst at an elevated temperature and pressure, wherein the catalyst comprises an oxygenated compound selected from the group consisting of oxygenated compounds of carbon, oxygenated compounds of boron, oxygenated compounds of nitroen, oxygenated compounds of sulfur, and mixtures thereof.

4,640,977

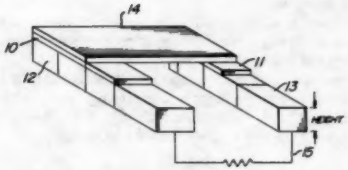
THERMOELECTRIC GENERATOR USING VARIABLE GEOMETRY WITH SUPPORT PEDESTALS OF DISSIMILAR MATERIALS THAN THE BASIC THERMOELECTRIC SEMI-CONDUCTOR ELEMENTS

Wallace Shakun, Atlanta, Ga., assignor to Omnimax Energy Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 603,009, Apr. 23, 1984. This application Apr. 16, 1986, Ser. No. 852,487

Int. Cl.[4] H01L *35/28*

U.S. Cl. 136—211 6 Claims



1. A thermoelectric generator comprising two legs of dissimilar thermoelements connected together at one of each of their respective ends, the other of each of their respective ends being adapted to be connected to an electrical load, each of said thermoelements being supported throughout the majority of its height by a separate support pedestal, each of said support pedestals extending beyond the other end of each of said thermoelement legs, the height of said support pedestals being selected by optimizing the effective figure of merit (Z_{eff}) of the thermoelectric generator in accordance with the following equation:

$$Z_{eff} = \frac{|\alpha_n| + |\alpha_p|}{R_{eff} R_{eff}}$$

where αn is the sum of the Seebeck coefficients of one series of legs of the thermoelectric generator and αp is the sum of the Seebeck coefficients of the other legs of the thermoelectric generator and R_{EFF} is the effective internal resistance of the system and K_{EFF} is the effective thermal conductance of the thermoelectric generator.

4,640,978

FOAM-SEALED ELECTRICAL DEVICES AND METHOD AND COMPOSITION THEREFOR

George J. Kilbane, White Bear Lake, and K. P. Subrahmanian, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 650,051, Sep. 13, 1984, abandoned. This application Jul. 15, 1985, Ser. No. 755,006

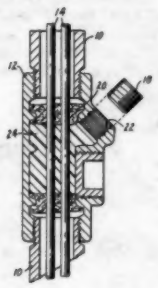
Int. Cl.[4] H02G *3/04;* C08G *18/14, 18/10*

U.S. Cl. 174—23 R 24 Claims

1. A method of sealing electrical fittings or cable duct comprising placing in the hollow portion of the fitting or duct to be sealed a foamable mixture of (a) a prereaction product of excess organic polyisocyanate and polyol and (b) a mixture of trimerizing catalyst capable of providing a cream time of at least about 90 seconds, chanin extenting against flame retardant agent, and blowing agent, and allowing the mixture of (a) and (b) to foam and cure in situ to form a removable, friable, flame retardant, solvent resistant, substantially closed cell isocyanurate foam having a density of about 80 to 240 kg/m^3.

11. A sealed electrical fitting comprising an electrical fitting filled with a removable friable, flame retardant, solvent resistant, substantially closed cell isocyanurate foam having a density of about 80 to 240 kg/m^3, said isocyanurate foam being prepared from a two-part, liquid, foamable, curable composition comprising a mixture of:

(a) in a first part, a prereaction product of excess isocyanate reactant material and polyol, and



(b) in a second part, catalyst, chain extending agent, fire retardant and water.

4,640,979

RADIO-FREQUENCY-TIGHT SHIELD WITH PLANAR PARTS

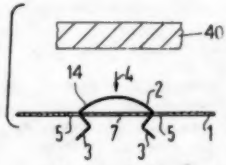
Dieter Schmalzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,194

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328386

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 GC 6 Claims



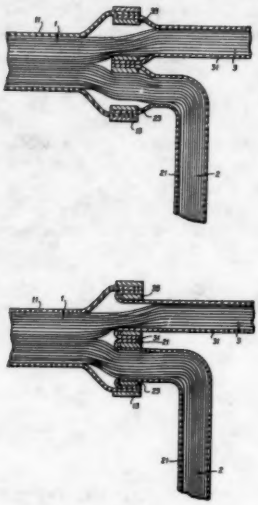
1. In a radio-frequency-tight shield for electronic devices, said shield including a frame and panel structure with planar parts, the improvement comprising one of the planar parts having at least one spring element being assembled thereon, said spring element having a center contact portion extending between two end portions, said end portions being bent to form hook-shaped sections for engaging spaced edges formed on the one planar part, said spring being assembled on the one planar part with the center contact portion extending beyond a surface of the one planar part and the hook-shaped sections of the end portions engaging said edges and forming detents to prevent the spring element from becoming removed from the one planar part.

4,640,980

ELECTRO-MAGNETIC SCREENING DEVICE FOR ELECTRICAL CABLING CONSTITUTING BUNDLES OF CABLES COMPRISING TAPPINGS

André Batt, Le Mesnil Saint Denis, and Jacques, J. A. Delabie, Bonneuil sur Marne, both of France, assignors to Societe Nationale d'Etude et de Construction de Meteur d'Aviation S.N.E.C.M.A., Paris, France

Filed May 24, 1985, Ser. No. 737,492
Claims priority, application France, Jun. 14, 1984, 84 09285
Int. Cl.[4] H02G 3/00; H01B 7/34
U.S. Cl. 174—36 5 Claims



1. An assembly of electro-magnetic screening devices, comprising:
- a first cable,
- a second cable,
- a third cable, said first, second and third cables being interconnected at a junction,
- a first metallic braided screening sheath enclosing the first cable,
- a second metallic braided screening sheath enclosing the second cable,
- a third metallic braided screening sheath enclosing the third cable, and
- metal rings respectively surrounding each of said cables and a corresponding sheath of said first, second and third sheaths at said junction, the metal ring of the first cable enclosing the remaining rings and end portions of the sheaths and serving to clamp the assembly together.

4,640,981

ELECTRICAL INTERCONNECTION MEANS

Ronald A. Dery, and Warren C. Jones, both of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 657,851, Oct. 4, 1984. This application Aug. 14, 1985, Ser. No. 765,625
Int. Cl.[4] H01R 4/00; H01B 7/08
U.S. Cl. 174—88 R 20 Claims

1. An electrical interconnection means of the type comprising a first insulating substrate having a plurality of conductors on one surface thereof and having an insulating adhesive in covering relationship to the conductors, the adhesive being flowable under pressure, the interconnecting means being characterized in that:
- the conductors are of conductive ink comprising an insulating polymer medium having first and second groups of conductive particles therein,
- the first group of particles are finely divided particles which are suspended in the medium and form a continuous conductive path along the length of each conductor,
- the second group of particles are agglomerates of large size particles which are randomly scattered throughout the conductive path and project above the surface of the medium, and
- the flowable adhesive extends over the surface of the insulating substrate, conductors, and projecting agglomerates to provide insulation whereby

upon locating and positioning the first insulating substrate conductors in an overlapping conducting relationship to conductors on a second substrate such that the flowable adhesive is disposed between the two substrates and applying pressure

to the positioned conductors and surrounding area, the adhesive flows from the positioned areas and exposes the protruding agglomerates thus bringing the exposed agglomerates into contact and electrical interconnection with the conductors on the second substrate accompanied by the adhesion of the remaining first substrate surface to the surface of the second substrate.

9. An insulating substrate comprising:
- an insulating member having at least one conductive path means thereon, said conductive path means in the form of a conductive ink including an insulating medium having a first group of finely divided conductive particles uniformly suspended and dispersed throughout said insulating medium and a second group of large size conductive particles randomly scattered throughout said insulating medium, some of the large size conductive particles projecting outwardly from said insulating medium, and
- an insulating layer secured onto the insulating member covering the conductive path means.

4,640,982

CABLE TERMINATION AND METHOD

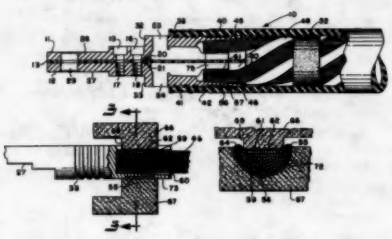
James J. Kasper, and John H. Jeffreys, both of Sheffield Lake, Ohio, assignors to Watteredge-Uniflex, Inc., Avon Lake, Ohio

Filed Mar. 22, 1985, Ser. No. 714,910
Int. Cl.[4] H02G 15/02
U.S. Cl. 174—75 R 6 Claims

1. A method of forming a cable termination comprising the steps of mechanically connecting a cable to a terminal having a socket formed by a round wall in which said cable end is positioned, and then surrounding said terminal and said cable end with a ring clip, and then pressing said ring clip and said cable end into said socket such that said ring clip is formed into a generally D-shape configuration having a straight wall portion, said straight wall portion being recessed below the edges of said socket, placing the round wall of said socket with said cable end thus mechanically connected thereto in a mating round recess in a refractory electrode of a press resistance welding machine, and then forcing a straight walled refractory electrode against the straight wall portion of said D-shape ring clip while passing current between such electrodes and

through said D-shape ring clip, cable, and terminal to elevate said D-shape ring clip, cable, and terminal to a high welding temperature to form a press resistance welded substantially integral connection.

2. A cable assembly comprising a termination including two electrically insulated half terminals each connected to a cable end by a connection, each of said connections comprising a socket formed by a half round wall of said half terminal, said



half round wall including a groove with a D-shape mechanically crimped ring clip having a straight wall portion positioned therein, said D-shape mechanically crimped ring clip surrounding and crimping a portion of said cable end and said half terminal, a reinforcing plate positioned between said straight wall portion and said cable end, and a press resistance weld forming a substantially integral connection between said cable end and said half terminal.

4,640,983

CONDUCTOR DEVICE, PARTICULARLY FOR AT LEAST PARTIAL INSERTION IN A HUMAN OR ANIMAL BODY, COMPRISING A SPIRAL FORMED FROM AT LEAST ONE CONDUCTOR

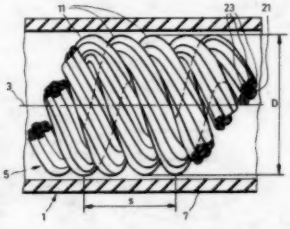
Pierre-Andre Comte, Liestal, Switzerland, assignor to Institut Straumann AG, Waldenburg, Switzerland

Filed Apr. 8, 1985, Ser. No. 720,550

Claims priority, application Switzerland, Apr. 9, 1984, 1773/84

Int. Cl.[4] H01B 5/10

U.S. Cl. 174—119 R **18 Claims**



1. A biomedical conductor device, for at least partial insertion in a human or animal body, comprising at least one spiral formed from a plurality of electrical conductors arranged to form a single-layer winding in the manner of a multiple thread, wherein each of said conductors is formed from several wires, wherein each wire consists of the same material over its entire cross section, wherein all adjacent windings of the conductors belonging to the same spiral are in uninsulated contact with each other and wherein said conductor is constructed so as to have a rope-like configuration with at least a part of said wires being helically wound around a central axis of said conductor so that the wires belonging to the same conductor are held together and are movable with respect to each other within certain limits, said spiral being formed to define at a central inner part thereof a cavity open at one end for insertion therein of a flexible mandrel through said open end to facilitate insertion of said conductor device into said human or animal body.

4,640,984

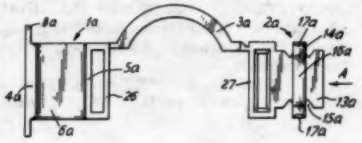
SUPPORT AND STRAIN RELIEF COMBINATION

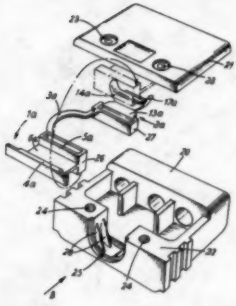
Jack W. Kalbfeld, Melville, N.Y., assignor to Union Connector Co., Inc., Roosevelt, N.Y.

Filed Aug. 2, 1984, Ser. No. 637,200

Int. Cl.[4] H01R 13/58

U.S. Cl. 174—135 **1 Claim**





1. A support and strain relief comprising the combination of a support having an opening and a strain relief to be engaged in the opening of the support, said strain relief being formed of a resiliently deformable material and including a first portion and an integral second portion, said first portion having a web with elongated linear ribs spaced apart in the direction of intended application to a multi-core cable or a plurality of wires disposed side by side, said web and said ribs defining collectively a trough, said second portion having a base elongated in the direction of intended application of the multi-core cable or the plurality of wires disposed side by side and a linear transverse wall upstanding intermediate the ends of the base, whereby a multi-core cable or a plurality of wires disposed side by side when placed between the first portion and the second portion and when abutted under pressure by said web and said ribs and said wall, will be forced into a U-shaped bend and will be tightly held by friction against movement relative to the strain relief, at least one of said first and second portions including lug means extending from a lateral edge thereof for abutment, when in use, against a surface of said support adja-

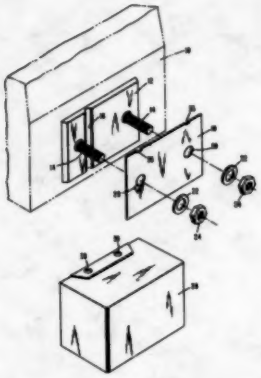
cent said opening in which the strain relief is to be engaged, and said support having two separate mating parts which, when assembled, define said opening to receive said strain relief, at least one of said mating parts including said surface for abutment by said lug means on the strain relief to resist the strain relief being separated from the support, and wherein said support has keying ribs and one of said first and second portions has cooperating keying ribs presented at its exterior for engagement with said keying ribs of said support in which the strain relief is to be positioned, thereby to key the strain relief against being pulled out of the support.

4,640,985

SNAP-FITTING TRANSFORMER TERMINAL COVER

Frank J. Martin; Murray Hartman, and Randy Saunders, all of Ontario, Canada, assignors to Schlumberger Canada Limited, Toronto, Canada

Filed Apr. 26, 1985, Ser. No. 727,877
Int. Cl.[4] H01R *13/44*; H01F *27/04*
U.S. Cl. 174—138 F **5 Claims**



1. A snap-fitting cover assembly for use with an electrical transformer of the type having a molded terminal block with secondary terminals projecting outwardly therefrom, comprising:

a backing plate having apertures for receiving said secondary terminals of the transformer and adapted to be mounted against the terminal block, peripheral edges of the backing plate dimensioned to extend slightly beyond opposite sides of the terminal block;

means for securing the backing plate to the terminal block;

a cover adapted to fit around the terminal block and backing plate, including means for snap-fitting the cover to the peripheral edges of the backing plate; and

means for securing the cover to said backing plate.

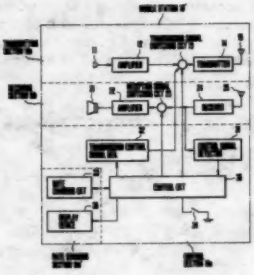
4,640,986

MOBILE RADIO COMMUNICATION SYSTEM

Akio Yotsutani; Masayuki Makino; Noboru Saegusa, and Tomoshi Sone, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 13, 1984, Ser. No. 650,767
Claims priority, application Japan, Sep. 16, 1983, 58-170758; Sep. 16, 1983, 58-170761
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 379—60 **12 Claims**

1. In a mobile radio communication system comprising a plurality of fixed stations respectively connected to a plurality of subscriber's lines extending from a telephone exchange, and a plurality of mobile stations linked with said fixed stations through radio channels, each of said mobile stations effecting speech via one of said fixed stations, the improvement which comprises means provided for each fixed station for transmitting rate charging information from said telephone exchange to



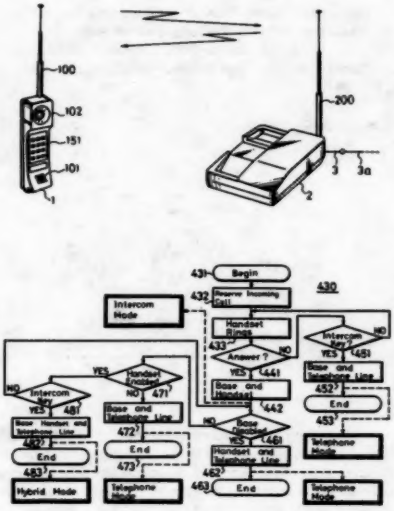
a mobile station under speech, and rate collecting means provided for each mobile station and being responsive to said rate charging information to vary its content.

4,640,987

CORDLESS TELEPHONE

Keizo Tsukada, Tokyo, and Masato Yamagata, both of c/o Sony Corporation, 7-35 Kitashinagawa 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 725,341
Claims priority, application Japan, Apr. 23, 1984, 59-81438; May 8, 1984, 59-91545
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—62 **12 Claims**



1. A cordless telephone, comprising:

a base unit connectable to a telephone network line for receiving and transmitting signals therethrough;

a handset unit selectively mountable upon and separable from said base unit;

said base and handset units each including means for the transmission and reception of signals therebetween over

electromagnetic waves, said handset unit further including handset loudspeaker/microphone means and said base unit having base loudspeaker/microphone means associated therewith;

connection means for selectively connecting said base and handset loudspeaker/microphone means with said telephone network line and with each other and including hold means for reserving and releasing a telephone call appearing on said telephone network line;

first actuable intercom key means at said base unit, and first enabling actuable at said base unit means for enabling communication of said base loudspeaker/microphone means with said handset loudspeaker/microphone means and said telephone network line;

second actuable intercom key means at said actuable unit and second enabling means actuable at said handset unit for enabling communication of said handset loudspeaker/-microphone means with said base loudspeaker/microphone means and said telephone network line and;

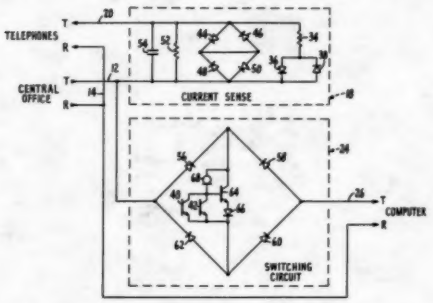
mode control means operative for selectively establishing a plurality of modes of said telephone including a telephone mode, wherein said hold means releases said telephone call and the loudspeaker/microphone means of one of said base and handset units is in communication with said telephone network line, and an intercom mode, wherein said hold means reserves said telephone call and said base and handset loudspeaker/microphone means are in communication with each other;

said mode control means being responsive to the existing mode of the telephone and to actuation of said intercom key means and enabling means so that, at a time when said telephone is in said telephone mode with one of said base and handset units being in communication with said telephone network line, said mode control means is responsive to actuation of the intercom key means at said one unit to establish said intercom mode, and at a time when said telephone is in said intercom mode, said mode control means is responsive to deactuation of the enabling means at one of said base and handset units to establish said telephone mode with the loudspeaker/microphone means of the other unit in communication with said telephone network line.

4,640,988
TELEPHONE INTERRUPTER

Michael A. Robinton, Palo Alto, Calif., assignor to Robinton Products, Inc., Sunnyvale, Calif.

Filed Apr. 3, 1984, Ser. No. 596,506
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—90 **24 Claims**



24. A telephone interrupter for use in a telephone system which includes a telephone line, first telephone apparatus connected to the line and second telephone apparatus, said interrupter comprising:

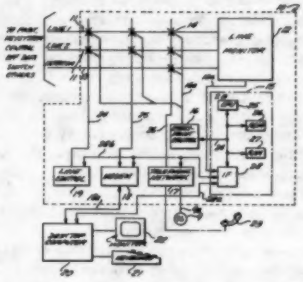
detecting means for coupling to the line and for detecting when the first telephone apparatus is utilizing the line by sensing current flow through the line, said detecting means including by-pass means for rejecting current flow on the line caused by ringing signals; and

switching means for coupling and decoupling the second telephone apparatus to and from the line in response to said detecting means.

4,640,989
COMMUNICATIONS UNIT FOR EXECUTIVE WORK STATION

Wilbur L. Riner, Roswell, and Bruce W. Watson, Norcross, both of Ga., assignors to Asher Technologies, Inc., Roswell, Ga.

Filed Jul. 23, 1984, Ser. No. 633,538
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—94 **9 Claims**



1. A communications unit comprising a work station having a desktop computer, the desktop computer having an access opening for a printed circuit board, a keyboard and a monitor screen, the communications unit further including, mounted on said circuit board:

a microcomputer;

a switch matrix;

a first plurality of horizontal lines included in the matrix; at least two external lines accessable by the horizontal lines;

a second plurality of vertical lines accessable by the horizontal lines;

a plurality of line monitors equal to said first plurality, each line monitor being operatively responsive to a respective horizontal line and each consisting of an analog-to-digital converter connected to the monitored line to sense the voltage on that line and convert that voltage to a digital signal, said converter operatively engaging an AND-gate addressable by said micro-computer to provide a digital indication of any status of the respective horizontal line in response to addressing by said microcomputer;

a third plurality of selectively switchable crosspoints for selectively associating any horizontal line with any vertical line, said crosspoints selectively controllable by

a crosspoint control circuit;

said microcomputer controlling said crosspoint control circuit;

a data modem responsively connected with a first one of said vertical lines for receiving and sending of data;

a telephone network responsively connected with another one of said vertical lines, said telephone network connected with a telephone handset having a receiver and a transmitter for voice transmission; and

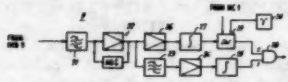
means for connecting said communications unit with a desktop computer.

4,640,990

TELEPHONE ANSWERING APPARATUS HAVING TWO INTEGRATORS OF DIFFERENT TIME CONSTANTS

Hideji Kawade, Yamato; Hideaki Takahashi; Yoshiyuki Sato, both of Yokohama, and Yuji Urayama, Machashi, all of Japan, assignors to Tamura Electric Works Ltd., Tokyo and Victor Company of Japan Limited, Yokohama, both of, Japan

Filed Dec. 28, 1983, Ser. No. 566,461
Claims priority, application Japan, Dec. 28, 1982, 57-230389
Int. Cl.[4] H04M 1/64
U.S. Cl. 379—77 11 Claims



1. A circuit for discriminating a command signal for operating a telephone answering apparatus adapted to be connected to a telephone line to transmit therethrough a recorded message to a calling station and to receive said command signal therefrom, said command signal including a series of tone bursts of a varying number signifying a particular operating mode of said apparatus, the discrimination circuit comprising:

a mechanical filter for passing components having the frequency of said received command signal;

a first integrator working cooperatively with said mechanical filter and responsive to the output thereof, said first integrator having a large time constant value for integrating said components passing through said mechanical filter to generate a continuous output signal during the reception of said tone bursts;

a second integrator having a small time constant value for integrating said received command signal to generate an output signal having an envelope substantially identical to the envelope of said tone bursts; and

a coincidence gate having first and second input terminals respectively coupled to the outputs of said first and second integrators for generating a coincidence signal when there is a match between the output signals of said first and second integrators.

4,640,991

ELECTRONIC AUDIO COMMUNICATIONS SYSTEMS NETWORK

Gordon H. Matthews, Plano; Thomas B. Tansil, and Michael L. Fannin, both of Dallas, all of Tex., assignors to VMX, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 97,240, Nov. 26, 1979, Pat. No. 4,371,752. This application Sep. 29, 1982, Ser. No. 427,640
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.[4] H04M 3/50
U.S. Cl. 379—88 16 Claims

11. A method for enabling communication between remote locations of a user's network telephone facility for storing and forwarding audio messages, comprising:

accessing one of a plurality of remotely disposed electronic communications systems coupled to one of the telephone facilities of a user's network telephone facility;

transmitting audio messages and route data to the accessed one of the communications systems from the user's telephone facility through which access was obtained;

the accessed one of the communications systems processing the audio messages and route data by:

storing digital representations of the audio messages transmitted from the user's telephone facility;

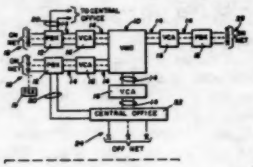
storing digital representations of the route data transmitted from the user's telephone facility and associated with the audio messages to indicate an intended recipient of the audio messages,

accessing stored digital representations of the audio messages in response to the route data,

reproducing the audio messages from the accessed stored digital representations of the audio messages to provide reproduced audio messages,

converting the stored digital representations of the associated route data to tone digit signals,

transmitting the tone digit signals and the reproduced audio messages to another one of the communications systems,



receiving tone digit signals for route data and reproduced audio messages associated with the route data transmitted by another one of the communications systems,

converting the tone digit signals received from the other of the communications systems to digital representations of the route data, and

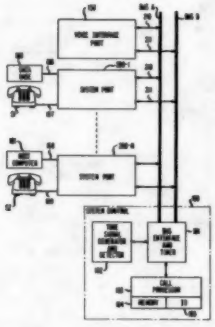
transmitting reproduced audio messages to a telephone facility of a recipient, indicated as the intended recipient by the route data associated with the reproduced audio messages.

4,640,992

SPEECH RESPONSE INTERFACE CIRCUIT

Richard C. Rose, Atlanta, Ga., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Sep. 10, 1984, Ser. No. 649,271
Int. Cl.[4] H04M 3/50, 11/00
U.S. Cl. 379—89 31 Claims



1. A voice response circuit for use in a communications system having a plurality of terminals interconnected for communications purposes by a common network controlled from a communication processor, said voice response circuit comprising

means for storing digitized voice messages received over

said network from a first specific one of said terminals communicating over said network,

means controlled jointly by said communication processor and a second specific terminal for establishing communication connections to said network so as to receive control data from others of said terminals communicating over said network,

means responsive to receipt of said control data from a specific other one of said other terminals for transmitting representations of said received control data to said second specific terminal, and

means responsive to receipt of instructional data from said second specific terminal for communicating a particular one of said stored voice messages to said specific other terminal over said network.

4,640,993

TELEPHONE SUBSCRIBERS' CIRCUITS

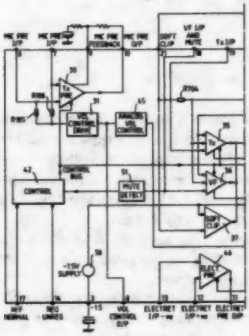
Edward J. W. Whittaker, Bishops Stortford, Great Britain, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 21, 1985, Ser. No. 747,480

Claims priority, application United Kingdom, Jun. 28, 1984, 8416414

Int. Cl.⁴ H04M *1/00*

U.S. Cl. 379—383 **1 Claim**



1. An electrical integrated circuit for use in a telephone subscriber's instrument, comprising; a plurality of circuit units each adapted for use in one or more of a plurality of different operating modes of the circuit, in which each said circuit unit is connected to the integrated circuits' power supply when in use, and having an electronic switch which when enabled switches its said circuit unit off, and in which the integrated circuit includes a control unit connected to said electronic switches and responsive to signals indicative of the circuit's operating mode to enable the electronic switches for such of the circuit units as are to be switched off, wherein each said electronic switch includes a current mirror arrangement with an input transistor and a plurality of output transistors, in which each said output transistor provides one of the bias currents needed to render its one of the circuit units operational, in which the electronic switch includes a normally cut-off control transistor whose emitter-collector path is connected across the emitter-collector path of the current mirror's input transistor, in which to enable the switch, to disable its said circuit unit, a signal is applied to the base of the control transistor to switch it on, and in which when the control transistor is switched on it diverts current from the input transistor of the current mirror, thus cutting off the current mirror output currents.

4,640,994

ELECTRONIC APPARATUS WITH A FLAT PANEL KEYBOARD UNIT

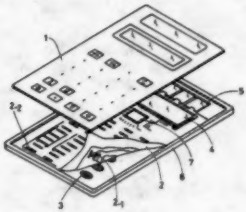
Shigeki Komaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 724,503, Apr. 19, 1985, abandoned, which is a continuation of Ser. No. 568,341, Jan. 5, 1984, abandoned. This application Feb. 7, 1986, Ser. No. 827,199

Claims priority, application Japan, Jan. 24, 1983, 58-10184

Int. Cl.⁴ H01H *13/70*

U.S. Cl. 200—5 A **5 Claims**



1. A flat panel keyboard comprising:

a flexible user-actuable surface plate having a plurality of key symbols adhered to the surface thereof which are visible to a user;

a flexible base with a connecting wiring pattern and key electrode pattern on the rear surface thereof, said key electrode pattern being a pair of electrodes in alignment with said plurality of key symbols;

a flexible cabinet member having a plurality of integral recessed portions in alignment with said key electrode pattern; and

a plurality of pressure sensitive conductive means positioned in said plurality of recessed portions, wherein said plurality of key electrode patterns are in continuous surface contact with said plurality of pressure sensitive conductive means so that upon actuation of one of said plurality of key symbols on said flexible user-actuable surface plate, a corresponding electrode pattern is forced against a respective pressure sensitive conductive means, shorting said electrode pattern and generating a signal;

said surface plate, said flexible base, and said flexible cabinet member being adhered together in a flat compact relationship, said flexible base includes a plurality of slits formed therein on either side of each of said pair of electrodes to facilitate an up-down actuation of said flexible base.

4,640,995

DEVICE FOR SELECTIVELY CONNECTING BETWEEN PARALLEL PATHS AND A COMMON PATH

Geert J. Nasijer, Louviers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 712,458, Mar. 15, 1985, abandoned, which is a continuation of Ser. No. 514,762, Jul. 18, 1983, abandoned. This application Oct. 23, 1985, Ser. No. 790,634

Claims priority, application France, Jul. 16, 1982, 82 12445

Int. Cl.⁴ H01H *21/78*

U.S. Cl. 200—11 DA **20 Claims**

1. A connection device comprising:

a base member having n connection locations and at least n+1 common path locations defined thereon, where n is greater than 2, said connection locations and common path locations being disposed at respective ones of 2^n equally spaced positions lying along a single circle only, concentric about a center,

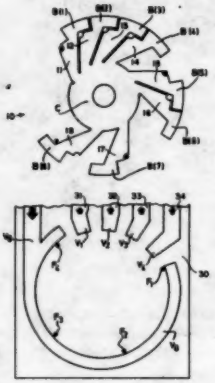
means for defining n paths along said base member, each path extending to a respective one of said connection locations,

means for defining a common path along said base member,

said common path extending to each of said common path locations,

a connection member comprising path means for communicating between 2^n-1 connection positions, each of said connection positions being arranged at a respective one of said 2^n equally spaced positions, and

means disengagingly connecting said connection member to said base member for permitting said connection member



to be oriented at a selected one of said 2^n equally spaced angular positions; said n connection locations being arranged with respect to each other, and said 2^n-1 connection positions being arranged with respect to each other, such that each of said 2^n equally spaced angular positions establishes communication between said common path and a respective one of 2^n distinct combinations of possible connections with said n paths.

4,640,996

IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINES

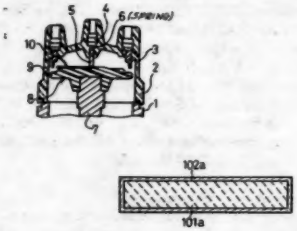
Ichirou Yoshida, Kariya; Morihiro Atsumi, Okazaki; Naotaka Nakamura, Chita; Kenji Yagi, Nagoya; Shunzo Yamaguchi, Okazaki, and Manabu Yamada, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 14, 1985, Ser. No. 744,733

Claims priority, application Japan, Jun. 26, 1984, 59-131544; Mar. 19, 1985, 60-55240

Int. Cl.[4] H01H *19/00*

U.S. Cl. 200—19 R **6 Claims**



1. An ignition distributor for an internal combustion engine which has a plurality of ignition plugs and a crankshaft comprising:

a plurality of stationary electrodes, each connected to one of said ignition plugs respectively; and

a rotary electrode coupled to said crank shaft of said internal combustion engine to rotate interlocked therewith, and located opposing each of said stationary electrodes so that a minute gap is formed between said rotary electrode and each of said stationary electrodes successively, upon rotation of said rotary electrode,

wherein at least one of:(a) each of said plurality of stationary electrodes, and (b) said rotary electrode comprises a main body composed of zinc oxide and ferrite and a surface layer mainly composed of ferrite integrally formed on the surface of said main body.

4,640,997

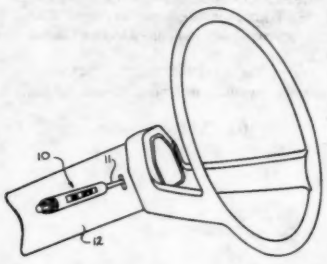
MULTIPLE FUNCTION CONTROL STALK INCLUDING PIVOTABLE HEADLIGHT DIMMER SWITCH

Wendell C. Lane, Jr., Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 11, 1985, Ser. No. 807,501

Int. Cl.[4] H01H *3/16, 9/00*

U.S. Cl. 200—61.54 **19 Claims**



18. A multiple function control stalk mounted on the outermost end of a turn signal lever extending outwardly from a steering column of a vehicle for controlling the operation of a plurality of controlled devices within the vehicle comprising:

an elongated housing including an aperture formed through an innermost end wall thereof;

a first switch mounting assembly disposed within said housing for controlling the operation of a first one of the plurality of control devices;

a second switch mounting assembly disposed within said housing for controlling the operation of a second one of the plurality of controlled devices;

a third switch mounting assembly disposed within said housing for controlling the operation of a third one of the plurality of controlled devices, said third switch mounting assembly being secured to the outermost end portion of the turn signal lever, the turn signal lever extending through said housing end wall aperture to said third switch mounting assembly;

means for pivotally connecting said third switch mounting assembly to said housing such that said housing is movable between a first position, wherein said housing is longitudinally aligned with the turn signal lever and said third switch mounting assembly, and a second position, wherein said housing is disposed at an angle relative to the turn signal lever and said third switch moutning assembly;

electrical switch means carried by said third switch mounting assembly and connected to the third one of the controlled devices, said electrical switch means being engageable with said end wall when said housing is pivoted from said first position to said second position for moving said electrical switch means from an opened position to a closed position so as to control the operation of the third one of the controlled devices; and

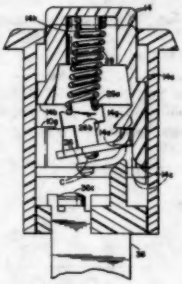
means for urging said housing toward said first position relative to the turn signal lever while permitting said housing to be pivoted toward said second position relative to the turn signal lever.

4,640,998

PUSH BUTTON SWITCH WITH COMPOUND CONTACT LEVER ACTION

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Jul. 9, 1985, Ser. No. 753,177
Int. Cl.[4] H01H *21/42*
U.S. Cl. 200—67 A 12 Claims



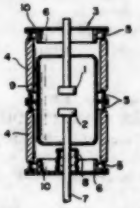
12. A push button switch assembly comprising a switch housing having a generally rectangular open top configuration and a bottom wall, a push button movable vertically in said top opening, center fixed contact means provided in said bottom wall and defining a primary and a secondary pivot axis adjacent the upper end thereof, at least one fixed contact also provided in said bottom wall and spaced from said center contact means, a movable contact lever pivotably mounted on said center contact means and having a raised land above said primary pivot axis, said lever having one end portion adapted to abut said one fixed contact in a first limit position for said lever, said lever having a second limit position wherein said lever moves around said primary pivot axis to raise said one end portion above said one fixed contact, biasing means acting between said raised land on said movable contact lever and said push button to urge the push button toward a normal position and to urge said contact lever toward said first or said second limit position according to the position of the lever beyond a mid-position intermediate said first limit position and said second limit position relative said primary pivot axis, said push button having depending abutment means provided thereon, said contact lever having another end portion opposite said one end portion and defining abutment surfaces adjacent said respective lever end portions, said push button abutment means engageable with said abutment surfaces of said contact lever to move said lever from one of said limit positions toward the other of said limit positions in response to initial downward push button movement, and camming means defined by said switch housing for engaging one of said lever end portions as that lever end portion moves into one of its limit positions for shifting said lever slightly on said secondary pivot axis to provide clearance for said depending abutment on said push button during upward return movement of said push button.

4,640,999

CONTACT MATERIAL OF VACUUM INTERRUPTER AND MANUFACTURING PROCESS THEREFOR

Yoshiyuki Kashiwagi; Yasushi Noda, both of Tokyo, and Kaoru Kitakizaki, Higashimine, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Aug. 8, 1983, Ser. No. 521,172
Claims priority, application Japan, Aug. 9, 1982, 57-138331; Jun. 22, 1983, 58-113290; Jun. 22, 1983, 58-113291
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B 8 Claims



1. A contact material of composite metal for a vacuum interrupter consisting essentially of:

a porous matrix containing between 10 and 70 weight % molybdenum powder and between 10 and 70 weight % chromium powder diffused into and bonded to each other, said porous matrix comprising insular particles of said molybdenum and chromium powders bonded to each other by sintering; and

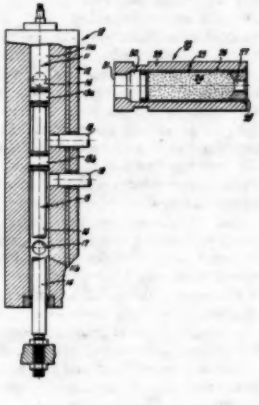
between 20 and 70 weight % copper infiltrated into and filling said porous matrix.

4,641,000

ACTUATOR FOR ELECTRICAL CIRCUIT INTERRUPTER USING NITROCELLULOSE TYPE SOLID PROPELLANT

Ronald W. Crookston, Trafford, and Jeffry R. Meyer, Pittsburgh, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 26, 1984, Ser. No. 665,021
Int. Cl.[4] H01H *33/28*
U.S. Cl. 200—148 R 7 Claims



1. An actuator for an electrical circuit interrupter having a power cylinder for operating said circuit interrupter from a high pressure gas flow said flow being provided by a pressure

generating power unit, said interrupter being of the type having a broad range of operating forces and operating over a wide range of ambient temperatures, such power unit being characterized by a shotgun type shell container being filled with a propellant having the following characteristics:

(a) spherical nitrocellulose base grains having a high nitroglycerin content

(b) a granulation of about 0.020 to 0.038 inches diameter range

(c) free of deterrent coating

(d) where said propellant is a small arms ammunition propellant having the properties of type WC 615 or WC 630 manufactured by Olin Corporation of East Alton, Ill.

said characteristics providing a said pressure for actuating said interrupter over said wide range of ambient temperatures and accommodating said broad range of operating forces.

4,641,001

CIRCUIT INTERRUPTER

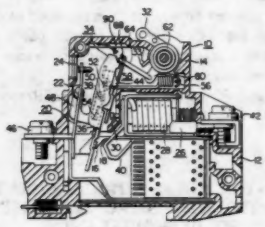
Hiroaki Fujihisa, Fukuyama; Hiroshi Fujii, Okayama; Hirotoshi Ohishi, and Yoshiaki Kobayashi, both of Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,836

Claims priority, application Japan, Jun. 15, 1984, 59-89969[U]; Jun. 15, 1984, 59-89970[U]

Int. Cl.⁴ H01H *3/00*

U.S. Cl. 200—153 G **5 Claims**



1. A circuit interrupter comprising:

a pair of separable contacts, at least one of which is movable;

an operating handle for manually operating said interrupter, and

an operating mechanism operatively connected to move said movable contact relative to the other contact for opening and closing said circuit interrupter;

said operating mechanism including:

a movable contact arm carrying said movable contact at one end and providing a latch surface at the other end;

a latch member pivotally mounted on said movable contact arm and having a latching end spaced from said latch surface to form a jaw therebetween;

a toggle link mechanism including a first link connected to said operating handle and a second link having one end pivotally connected to said first link and a second end, said toggle link mechanism having an extending position corresponding to an open contact position of said handle and a collapsed position corresponding to a closed contact position of said handle, said second link being adapted to be received and held in said jaw by engagement with said latching end and said latching surface to operate said movable contact arm to manually open and close said contacts by said interrupter upon movement of said handle between open and closed positions, said second end of said second link being slidably released from said jaw by coaction with said latch surface upon movement of said latching end away from said latch surface which is caused by said operating mechanism when said interrupter is tripped; and

means including a yieldable member providing a yieldable stop surface for preventing return movement of said toggle link mechanism from said extended position after the trip operation to a reset position and for yieldably maintaining said toggle link mechanism at a position in which said toggle link mechanism is partly collapsed, said yieldable member being adapted to yield in response to manual effort on said operating handle to release said toggle link mechanism for return movement.

4,641,002

ELECTRICAL CONTACT

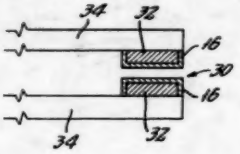
Uwe Maixner, Barum, and Dieter Milferstaedt, Tespe-Buetlingen, both of Fed. Rep. of Germany, assignors to Gesellschaft Fuer Kernenerg Ieverwertung in Schiffbau und Schiffahat GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 525,968, Aug. 24, 1983, abandoned, which is a division of Ser. No. 057,693, Jul. 16, 1979, Pat. No. 4,413,302. This application Sep. 23, 1985, Ser. No. 779,301

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831791

Int. Cl.⁴ H01H *1/02*

U.S. Cl. 200—268 **1 Claim**



1. A pair of electric contacts, each contact having an electrically conductive metallic body comprising a metal selected from the group consisting of titanium and zirconium, each of said contact bodies forming one of a pair of cooperating, mutually engageable contact surfaces, at least one of said electric contact surfaces having a layer of titanium nitride or zirconium nitride, said layer being intimate and direct contact with the metal of said body without an intervening oxide layer.

4,641,003

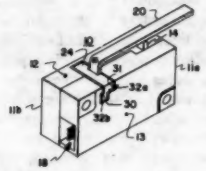
LEVER OPERATED SWITCH WITH IMPROVED LEVER INTERCHANGEABILITY

Eugene D. Alfors, Rockford, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 6, 1984, Ser. No. 669,184

Int. Cl.⁴ H01H *3/20*

U.S. Cl. 200—332 **17 Claims**



1. In a device of the type including a housing in which is mounted a mechanism actuated by a plunger extending through a wall of the housing and adapted for reciprocal movement, the plunger being operated in at least one direction by a lever having a laterally oriented pivot portion supported by the housing, the improvement which comprises a retainer adapted to be removably held in a cavity in the housing, said

retainer and at least a portion of the bounding surface of the cavity cooperatively defining a recess configured to hold the pivot portion of the lever captive when said retainer is in place and to release the pivot portion of the lever for the recess when said retainer is removed.

4,641,004

KEY MODULE FOR KEYBOARDS HAVING A DOME-SHAPED KEY MEMBER OF RESILIENT MATERIAL

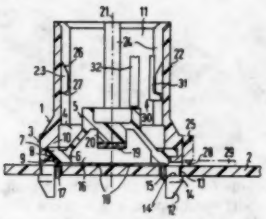
Jaroslav Keprda, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,794

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 8334679[U]

Int. Cl.[4] H01H *3/12*

U.S. Cl. 200—340 **8 Claims**



1. A key module for mounting on a base plate which carries at least one fixed contact, said key module comprising:

a bell-shaped resilient key member including chamber means defining a contact chamber for the at least one fixed contact carried on the base plate, at least one movable contact mounted on said bell-shaped key member to contact the at least one fixed contact in response to the application of an operating force to said bell-shaped key member, an edge portion defining an open end of said bell-shaped key member, and projection means projecting laterally from and about said edge portion;

a one-piece key housing part surrounding said bell-shaped key member and including recess means constituting at least one access opening at essentially right angles relative to the base plate for tightly receiving said projection means to form a composite member with said bell-shaped key member with said projection means pressed and extending through said openings into said recess means; and

mounting means extending from said composite member for mounting the same to the base plate with said edge portion pinched therebetween.

4,641,005

FOOD RECEPTACLE FOR MICROWAVE COOKING

Oscar E. Seiferth, Madison, Wis., assignor to James River Corporation, Richmond, Va.

Continuation of Ser. No. 21,258, Mar. 16, 1979, abandoned. This application Jan. 21, 1986, Ser. No. 820,593

Int. Cl.[4] H05B *6/80*

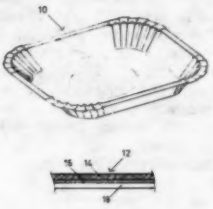
U.S. Cl. 219—10.55 E **8 Claims**

1. A laminate for use in a disposable container adapted to heat the surface of a quantity of food when exposed to microwave energy, said laminate comprising

(a) a continuous microwave interactive layer of elemental metal having a thickness which is sufficiently small to cause said microwave interactive layer, when subjected to microwave energy, to heat up to a temperature which is sufficient to heat the surface of food in heat transfer relationship therewith,

(b) protective means for said microwave interactive layer, said protective means including a smooth surfaced plastic film having sufficient stability at high temperature that it will not degrade when the laminate is subjected to sufficient microwave energy to heat the surface of the quantity of food, and

(c) support means for providing structural support for said interactive layer and said plastic film, said support means being formed of paper stock material having sufficient structural stability at the high temperature necessary for heating the surface of the quantity of food to maintain its physical shape;



wherein said laminate is formed by the process including the successive steps of vacuum depositing said microwave interactive layer onto a smooth surface of said plastic film followed by the step of bonding directly said plastic film upon which said microwave interactive layer has been vacuum deposited to one side of said paper stock material in a manner to cause said plastic film and said microwave interactive layer to be held in bonded relationship with said support means to cause the surface of a quantity of food, when in heat transfer relationship therewith, to be heated when the laminate is subjected to microwave energy.

4,641,006

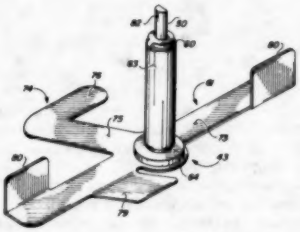
ROTATING ANTENNA FOR A MICROWAVE OVEN

Frank E. Ross, and William H. Hunter, both of Newton, Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Sep. 30, 1985, Ser. No. 781,797

Int. Cl.[4] H05B *6/72*

U.S. Cl. 219—10.55 F **3 Claims**



1. A microwave oven, comprising: means including a plurality of walls defining a heating cavity, a source of microwave energy disposed outside of said heating cavity, a waveguide extending between said source of microwave energy and one wall of said means defining a heating cavity, a rotatable antenna disposed at least partially in said heating cavity and electrically insulated from said means defining a heating cavity and from said waveguide, and drive means for rotating said rotatable antenna, said rotatable antenna including receiver means in the form of a probe extending into said waveguide from said heating cavity at a position spaced from said source of microwave energy for receiving microwave energy therefrom, said rotatable antenna further including center-fed elongated sheet metal radiator means disposed in a plane within

said heating cavity spaced from said one wall and electrically connected to said probe for conducting microwave energy therefrom and for radiating said microwave energy from along its length into said heating cavity, said rotatable antenna further including radiation modifying means comprising a sheet metal auxiliary radiating element formed integrally with and extending outwardly from said elongated radiator means, said auxiliary radiating element including a first portion connected to said elongated radiator means and extending outwardly in said plane at an acute angle to one end of said elongated radiator means and a second portion connected to said first portion and extending in said plane toward the other end of said elongated radiator means at an acute angle to said first portion, said radiation modifying means being operable for modifying the relative radiation from portions of said elongated radiator means and defining with said elongated radiator means a rotating radiation pattern providing increased radiation in the central portion as compared to the outer portions of said heating cavity, said rotatable antenna further including impedance balancing means for effectively matching the impedance of said source of microwave energy with the impedance of said heating cavity.

4,641,007

PROCESS AND DEVICE FOR TREATMENT OF METAL-BONDED NONCONDUCTIVE MATERIALS

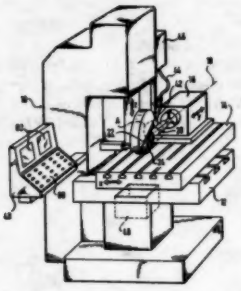
Horst Lach, Dammstrasse 5, D-6450 Hanau 1, Fed. Rep. of Germany PCT No. PCT/EP82/00221, § 371 Date Jun. 1, 1983, § 102(e) Date Jun. 1, 1983, PCT Pub. No. WO83/01216, PCT Pub. Date Apr. 14, 1983

Filed Jun. 1, 1983, Ser. No. 503,157

Claims priority, application European Pat. Off., Oct. 5, 1981, 81107929.2; Fed. Rep. of Germany, May 28, 1982, 3220207

Int. Cl.[4] B23H *5/04, 5/06, 7/30*

U.S. Cl. 219—69 M **34 Claims**



1. A method for combined electro-erosive machining/mechanical grinding of a workpiece of metal-bonded electrically non-conductive hard materials in an electrically conductive metal matrix comprising the steps of:

(a) providing a combined spark erosion-mechanical grinding tool consisting of electrically nonconductive abrasive material in an electrically conductive metal matrix;

(b) rotating said tool in close non-contact relationship to said workpiece;

(c) applying an electrical potential between said tool and said workpiece thus establishing a circuit effecting spark erosion between juxtaposed metal matrix portions of said tool and said workpiece;

(d) moving said tool relative to said workpiece for forming a predetermined profile on said workpiece;

(e) adjusting the non-contact distance between said tool and said workpiece in dependence upon the difference in an electrical signal derived from said circuit when metal matrix materials are in juxtaposition of said tool and workpiece for forming the predetermined profile of the metal matrix portion of said workpiece; and

(f) moving said tool into grinding contact with said workpiece when said tool is juxtaposed said electrically nonconductive hard materials of said workpiece for forming the predetermined profile of the electrically nonconductive hard materials of the workpiece in response to an electrical signal derived from said circuit.

4,641,008

APPARATUS FOR ELECTRICAL RESISTANCE SEAM WELDING BY ROLLERS

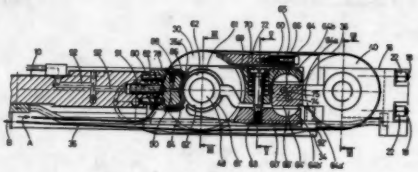
Niklaus Portmann, Bellikon, and Alfonso D'Aniello, Urdorf, both of Switzerland, assignors to Elpatronic AG, Switzerland

Filed Nov. 21, 1985, Ser. No. 800,554

Claims priority, application Switzerland, Nov. 23, 1984, 5601/84

Int. Cl.[4] B23K *11/06*

U.S. Cl. 219—84 **14 Claims**



1. An apparatus for electrical resistance seam welding by rollers, said apparatus comprising: a welding arm disposed on a machine upright and having a free end, an internally cooled electrode roller rotatably secured to the free end of the welding arm and having at least one annular contact surface rotating with the electrode roller by which welding current is supplied to the roller, two contact jaws having curved contact surfaces in contact with said at least one annular contact surface rotating with the electrode, each jaw having a contact member bearing against a current-carrying surface associated with the welding arm, spring means associated with the jaws for pressing the curved contact surfaces of the jaws and the contact members against the annular contact surface of the electrode roller and against the current-carrying surface of the welding arm respectively under spring force, a cooling device provided on the arm to supply cooling ducts in the electrode roller with coolant and a lubricating device to supply the annular and the curved contact surfaces with contact oil, and wherein the apparatus is characterised in that the electrode roller (30) includes a spindle (32) which can be clamped onto the welding arm (10) and a rotor (31) which is rotatably mounted on the spindle and which has a narrow disc-shaped center portion (33) and two broad cylindrical hubs (35,35'), the peripheral surfaces (35*a*, 35*a*') of which form two rotating annular contact surfaces, the center portion containing, immediately below its outer peripheral surface (33*a*), an annular cooling duct (37) which is in communication, through substantially radial cooling ducts (39,39'), with axial cooling ducts (43,43') inside the spindle (32) of the electrode roller; the welding arm (10) which acts as an electrical conductor, defines forks (24,24') at the free end (12) and has bearing depressions (26,26') in the ends of the forks (24,24') to receive the spindle (32) of the electrode roller (30); the welding arm (10) is bridged at the free end (12) by a clamping member (14) which is detachably connected thereto and acts as an electrical conductor, and the clamping member has two further bearing depressions (28,28') to receive the spindle of the electrode roller; electrically conductive caps (48,48') are placed on each end of the spindle of the electrode roller and are clamped between adjacent bearing depressions (26,28;26',28') of the arm and the clamping member to transmit current from the welding arm (10) to the clamping member (14); the contact jaws (60,60') are forked at their ends adjacent to the electrode roller and so have a total of four curved contact surfaces (62,62') making contact with the hub surfaces (35*a*,35*a*'); the contact members (64,64')

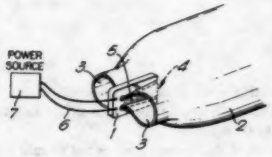
are pivotally mounted in the contact jaws (60,60') and bear, with plane or cambered contact surfaces (64a, 64a'; 16a), against current-carrying surfaces (66,66') on a transverse web (65) of the clamping member; cooling ducts (52,52') are provided in the welding arm (10) and lead into the bearing depressions (26,26') of the arm which cooling ducts are in communication, through bores (48a') in the caps, both with axial cooling ducts (43,43') inside the spindle (32) of the electrode roller and with further cooling ducts (54,54';74,75) provided in the clamping member (14) and leading through the transverse web (65); and at least one felt lubricating segment (78,78') which is urged resiliently against the hub surfaces (35a,35a') and is periodically supplied with contact oil is provided as a lubricating device between the forks (24,24') of the welding arm (10).

4,641,009

BRANCH-OFF TECHNIQUE

Jan Vansant, Leuven; Noel Overbergh, Bertem; Valere Buckers, Elem-Halen, and Amandus L. E. Pieck, Kortenaken, all of Belgium, assignors to N.V. Raychem S.A., Diestsesteenweg, Belgium

Filed Jan. 8, 1985, Ser. No. 689,622
Int. Cl.[4] H05B *3/06*; H02G *15/18*; B29C *61/02*
U.S. Cl. 219—200 **22 Claims**



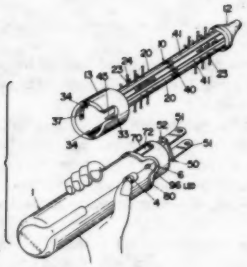
1. A branch-off clip which comprises at least two outer legs and an inner leg, so arranged that the clip can be positioned over an outer surface of a sleeve at an end thereof with the outer legs outside the sleeve and the inner leg inside the sleeve to form at least two terminal conduits in the sleeve; the inner leg comprising a heating means.

4,641,010

BATTERY POWERED ELECTRIC HAIR CURLER

Yoshinori Abura; Eiji Tsuji; Kenji Okuyama, and Shuhei Ochi, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 4, 1985, Ser. No. 697,934
Claims priority, application Japan, Feb. 15, 1984, 59-26518
Int. Cl.[4] H05B *3/00*; H01C *3/10*; A45D *1/04, 2/36*
U.S. Cl. 219—222 **19 Claims**



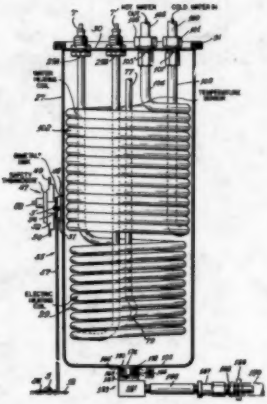
1. A hair curler including an elongated barrel provided with an electric heater for curling hair wound on the barrel and a handle supporting the barrel; said electric heater comprising a plurality of resistor elements in the form of strips extending along the length of the barrel in generally spaced parallel relationship with one another and being electrically connected in a series by a plurality of bridging segments, and said electric heater being mounted on the exterior of the barrel such that the resistor elements are exposed on the outer surface of the barrel in circumferentially spaced relationship to one another around the barrel with each of the resistor elements being formed to have a generally U-shaped cross section with a pair of opposed legs connected by a web, the resistor elements being mounted on the barrel with their webs exposed on the outer surface of the barrel, the legs depending from opposite sides of the web in such a manner as to leave thereat rounded side edges, and means for connecting the electric heater to a source of electric power.

4,641,011

IMPROVED SAFETY THERMOSTAT SYSTEM FOR ELECTRIC BEVERAGE MAKING DEVICE

Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Division of Ser. No. 633,417, Jul. 23, 1984, Pat. No. 4,602,145.
This application Sep. 23, 1985, Ser. No. 780,257
Int. Cl.[4] H05B *1/02, 3/82*; F24H *1/20*; A47J *31/00*
U.S. Cl. 219—328 **5 Claims**



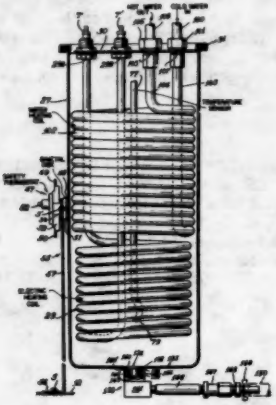
1. In a beverage-making device of the type having a covered water container for storing a quantity of water for use, the water container having an exterior sidewall and being heated by a looped coil-type heating element arranged interiorly thereof, said heating element having a plurality of coil loops, wherein at least one loop of the coil extends around the interior of the water container near the sidewall thereof, and running thermostat means capable of activating said heating element responsive to water temperature changes sensed within said container to maintain the temperature of the stored water in the container at a predetermined value, the improvement comprising a safety thermostat arranged to be capable of deactivating said heating element upon sensing temperature at the exterior sidewall of said container in excess of said predetermined value and a mounting means therefor, said safety thermostat being attached to said mounting means and disposed against the exterior sidewall of the container generally about at or below the midpoint height thereof and close to said at least one coil loop of said heating element, said safety thermostat being in series in an electrical circuit with said running thermostat whereby the running thermostat is capable of being overridden by the safety thermostat upon reaching a temperature in excess of said predetermined value to de-activate the heating element.

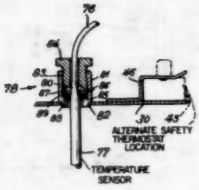
4,641,012

THERMOSTAT SENSING TUBE AND MOUNTING SYSTEM FOR ELECTRIC BEVERAGE MAKING DEVICE

Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Division of Ser. No. 633,417, Jul. 23, 1984, Pat. No. 4,602,145.
This application Sep. 23, 1985, Ser. No. 778,908
Int. Cl.[4] H05B *1/02, 3/82;* F24H *1/20;* A47J *31/00*
U.S. Cl. 219—331 6 Claims





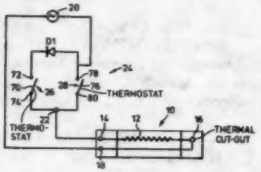
1. In a beverage-making device of the type having a hot water container, a cover mounted on top of the container, and a running thermostat system having a thermostat attached at said cover and communicating through a capillary tube with a temperature sensing means disposed below said cover and extending interiorly of said container, the improvement wherein said temperature sensing means comprises a sensing tube extending for substantially the full height of said container and having an upper end thereof attached at said cover by releasable engaging means, the sensing tube having a diameter of no greater than about 0.30 inches, said capillary tube extending from the upper end of said sensing tube to the thermostat, said sensing tube being rigid and depending freely within the container, said thermostat and sensing tube being cooperative to detect the mean temperature of the water in said container and capable of being quickly responsive to water temperature change in a spread of less than about six degrees Fahrenheit, said releasable engaging means being releasable to permit said sensing tube to be removed from said container through said cover while said cover remains mounted on top of said container.

4,641,013

DUAL STAGE THERMOSTAT AND ELECTRIC SPACE HEATING SYSTEM

Gerald Dunnigan, Brantford, and Ardeshir Bandari, West Vancouver, both of Canada, assignors to Westcan Manufacturing Ltd., Vancouver, Canada

Filed Dec. 14, 1983, Ser. No. 561,486
Claims priority, application Canada, Mar. 4, 1983, 422882
Int. Cl.[4] H05B *1/02;* G05D *23/10;* H01H *37/12, 37/54*
U.S. Cl. 219—364 9 Claims



7. A space heating system comprising:

(1) an electrical space heater having a single heater element of at least 1,000 watts,

(2) and a dual level thermostat connected to said heater, said thermostat comprising:

(a) first temperature dependent electrical switch means operable between open and closed conditions dependent upon the temperature at said first switch means and including first adjustment means for varying the temperature setting at which said first switch means changes between open and closed conditions, said first switch means having first and second terminal means,

(b) second temperature dependent electrical switch means operable between open and closed conditions dependent on the temperature at said second switch means and including second adjustment means for varying the temperature setting at which said second switch means changes between open and closed conditions, said second switch means having third and fourth terminal means,

(c) said first switch means being set to open at a first temperature and said second switch means being set to open at a second temperature slightly below said first temperature,

(d) fifth terminal means connected to said first and third terminal means,

(e) a diode means connected between said second and fourth terminal means,

(f) sixth terminal means connected to said fourth terminal means and separated from said second terminal means by said diode means,

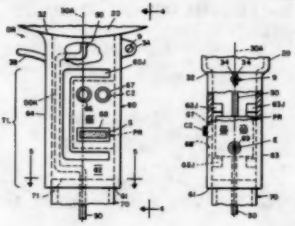
(g) means adapted to connect one of said fifth and sixth terminal means to one terminal of said space heater which space heater includes another terminal for connection to an AC power supply and adapted to connect the other of said fifth and sixth terminal means to said AC power supply,

so that when the temperature is below said second temperature, full power will be available at said one of said fifth and sixth terminals and when the temperature is between said first and second temperatures, only approximately one-half of the power available from said AC power supply will be available at said one of said fifth and sixth terminals.

4,641,014
HAND-HELD HAIR DRYER HAVING HOUSED RADIO RECEIVER

Todd A. Bland, 5729 S. 152nd Ave., Omaha, Nebr. 68137

Filed Apr. 18, 1985, Ser. No. 724,595
Int. Cl.[4] H05B *1/00*; H04B *1/08*; A45D *20/42, 20/12*
U.S. Cl. 219—370 2 Claims



1. Improved hand-held hair drier comprising:

(A) an elongated tubular barrel portion having an outlet-end and an inlet-end, said barrel between said ends being internally provided with a heating element means of the high-resistance electrical conductor type;

(B) a hollow volute portion attached to and communicating with said tubular barrel inlet-end, said volute being internally provided with a rotatable impeller and having air-intake means, whereby impeller rotation causes ambient air to be drawn into the air-intake means and driven through the heating element means and ultimately out the barrel outlet-end as a hotair bath for drying the user's hair;

(C) an elongated tubular base portion extending transversely to the longitudinal axis of the barrel and having an upper end attached to said volute and a lower end located remotely from said volute, the major portion of the length of said tubular base having a substantially rectangular cross sectional shape including a pair of substantially parallel opposed base-sides, said opposed base-sides being provided with substantially mirror image indentations cooperating to provide a secure seat adapted to cradle a conventional portable radio receiver, and at least one of said base-sides being provided with window means; and

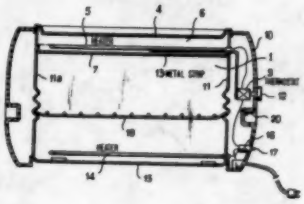
(D) a conventional portable radio receiver comprising control and sound-emission means, said radio receiver being stably seated within the said opposed indented portions of said base-sides, and the radio receiver control and sound-emission means being positioned in registry with said base portion window means.

4,641,015
PORTABLE COOKING APPLIANCE COMPRISING AN OVEN CHAMBER AND A COOKING HOTPLATE

Jacques Mayeur, Seynod, France, assignor to SEB S.A., Selongey, France

Filed Jan. 15, 1985, Ser. No. 691,641
Claims priority, application France, Feb. 3, 1984, 84 01661
Int. Cl.[4] F27D *11/00*
U.S. Cl. 219—386 6 Claims

1. A portable cooking appliance comprising a chamber (1) constituting an oven having lateral faces, in which at least one of the lateral faces is closed by a door (3), said chamber having a bottom wall (15), a first electric resistance heating element (14) which extends within said chamber near said bottom wall (15), the appliance being further provided with a cooking hotplate (4) located at the top of the appliance above the oven chamber (1), and a second electric resistance-heating element (5) extending beneath and hotplate and located with in a compartment (6), a metal plate (7) between the chamber (1) and the compartment (6), said compartment (6) communicating with the chamber (1) by means of at least one opening (8) through said plate (7), wherein said second resistance-heating element (5) is connected to the electrical power supply by an adjustable thermostat (9) associated with a temperature probe (13) which extends within said compartment (6) and wherein said first resistance-heating element (14) within the oven chamber (1) is connected directly to the electrical power supply, the power of the first resistance-heating element (14) being lower than that of the second resistance-heating element (5) and being adapted to heat the chamber to a predetermined temperature, the two



said resistance-heating elements being connected to switch means (16,18) to enable operation of the appliance in the three following conditions:

a condition in which only the first heating-resistance (14) heats the chamber (1),

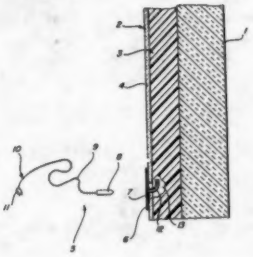
a condition in which only the second heating-resistance (5) heats the compartment (6), and

a condition in which the two heating resistances (14,5) heat both the chamber (1) and compartment (6).

4,641,016
DEVICE FOR FORMING TUNNELS IN COMPOSITE WALL PANELS

Michel Garcia, 2 place de l'Hôtel de Ville, Miramont De Guyenne, France

Filed Nov. 28, 1984, Ser. No. 675,643
Claims priority, application France, Nov. 30, 1983, 83 19262
Int. Cl.[4] B23B *49/00*; H05B *3/44*
U.S. Cl. 219—523 9 Claims



1. Device for boring tunnels in the thickness of an insulative material constituting a composite wall panel comprising a layer of said material covered on at least one side with a rigid facing sheet, said device comprising:

a mobile system incorporating a boring member and a flexible member at an end of which said boring member is mounted;

and means for positioning and guiding said mobile system including a removable support exhibiting means for attaching said removable support to a rigid facing sheet in line with an opening formed therein, and bent conduit means for guiding said boring and flexible member to penetrate into said insulative material parallel to said facing sheet in a preset direction and to a desired distance

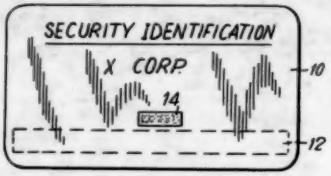
connected to said removable support and adapted to extend beyond said means for attaching.

4,641,017

FRAUD RESISTANT CREDIT CARD SYSTEM

Herman Lopata, 144 E. Kingsbridge Rd., Mount Vernon, N.Y. 10550, assignor to Herman Lopata, Mount Vernon, N.Y.

Filed Dec. 15, 1983, Ser. No. 561,638
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—457 6 Claims



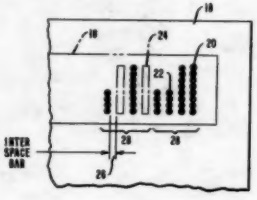
1. Tamper proof credit or identification card, comprising a flat card member adapted to identify an authorized bearer thereof, automatically-readable indicia on one surface of the flat card member containing data relating to the authorized bearer, and a separate reflective hologram disposed on a surface of the flat card member, the automatically-readable indicia being spaced apart from the hologram, the hologram being so constructed that a reference light beam impinging thereon from light source means at one predetermined angle and orientation to said one surface of the card will produce an image at another predetermined angle relative to said reference beam to impinge on sensor means disposed at a predetermined position relative to said light source means.

4,641,018

BAR CODE AND READING AND DECODING DEVICE

Ali T. Mazumder, and Mohamed S. Kamel, both of Waterloo, Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 9, 1984, Ser. No. 670,424
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—462 28 Claims



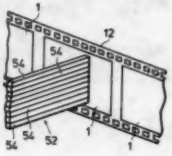
1. A record medium having a background of a given sensible characteristic and having sensible indicia located thereon in a plurality of zones of substantially equal area; each zone representing a predetermined value and comprising a plurality of elements each selected from a group comprising a first element in the form of a bar having a first length, a different sensibility than said background and a given width; a second element in the form of a bar having a different length than said first element, a different sensibility than said background and having a width substantially the same as said given width; and a third element in the form of a space having a width substantially the same as said given width and having the sensible characteristic of said background.

4,641,019

AUTOMATIC NOTCHER WITH JUDGING DEVICE FOR FILM FRAMES TO BE PRINTED

Kenichi Inatsuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 3, 1985, Ser. No. 740,457
Claims priority, application Japan, Jun. 1, 1984, 59-081789 [U]; Jun. 1, 1984, 59-081790 [U]
Int. Cl.[4] G01J 1/20; G01N 21/00
U.S. Cl. 250—201 22 Claims



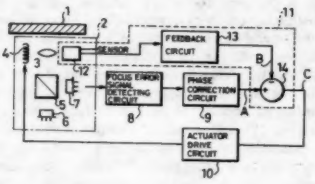
1. An automatic notcher comprising:
(a) conveyor means for conveying a developed film;
(b) a film density detector which optically detects film densities at a plurality of points, said film density detector including a film frame edge detection portion, a large-spot detection portion and a small-spot detection portion;
(c) film density reading means for reading film densities from said film density detector every time said film is conveyed a predetermined distance;
(d) film density memory means for storing the film densities read by said film density reading means;
(e) frame position judging means for judging a film frame position from the film density data stored in said film density memory means;
(f) faulty frame judging means including out-of-focus image judging means for judging an out-of-focus image by calculating the intensity of an image pattern edge of said film and the degree of contrast thereof from said film density data; and
(g) a notcher controlling circuit adapted to actuate a notcher at a notch forming position on said film only for necessary frames in accordance with data from said faulty frame judging means and said frame position judging means,
whereby judgement is automatically made as to whether or not each of the frames on said developed film need be printed, and a notch is formed only for frames which need to be printed.

4,641,020

OPTICAL HEAD POSITION CONTROL DEVICE

Nobuo Iwai, Yokohama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jul. 27, 1984, Ser. No. 635,261
Claims priority, application Japan, Jul. 28, 1983, 58-117784[U]
Int. Cl.[4] G01J 1/20
U.S. Cl. 250—201 4 Claims



1. In an optical head position control device for controlling

the position of an optical head emitting a source beam and receiving a reflected beam image from a surface of an optical storage medium, said device comprising an objective lens for transmitting the source beam to the surface of the medium and for receiving the reflected beam image, a tracking actuator for driving the objective lens in a radial tracking direction, and a focusing actuator for driving the objective lens in a focusing direction, said focusing actuator being controlled on the basis of a focus error detecting circuit which detects focus error from said reflected beam image and provides an output control signal to said focusing actuator,

the improvement in which said device further comprises:

an objective lens focal position sensor for detecting the position of said objective lens in the focusing direction, and

a focusing feedback circuit for producing a focusing negative feedback signal on the basis of a detection signal from said objective lens focal position sensor,

said focusing negative feedback signal being superposed on said output control signal for said focusing actuator.

4,641,021

VARIABLE BANDWIDTH LOW-PASS FILTER FOR LINE TRACER ACCURACY CONTROL

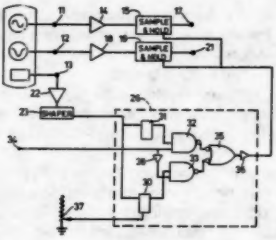
Enn Vali, Burlington, Canada, assignor to Westinghouse Canada Inc., Hamilton, Canada

Filed Jan. 22, 1985, Ser. No. 693,540

Claims priority, application Canada, Mar. 21, 1984, 450133

Int. Cl.[4] G05B *1/00, 19/33, 21/02*

U.S. Cl. 250—202 **3 Claims**



1. A circular scanning optical pattern tracer including an optical scanner, means in said scanner to produce a reference sine wave, a reference cosine wave and a sensing pulse indicative of the time the scan intercepts the pattern, a pair of sample and hold circuits for producing coordinate signals representative of the coordinate velocities required to drive a servo system which moves the machine tangential to the pattern, means to apply said sine wave to one of said sample and hold circuits and means to apply said cosine wave to the other of said sample and hold circuits, means to derive a first and a second sampling pulse from said sensing pulse means and to selectively apply said first or said second sampling pulse to said sample and hold circuits and means to alter the duration of said first sampling pulse over a range of values such that the duration of said sampling pulse determines the frequency response of said sample and hold circuits.

4,641,022

RANGE FINDING DEVICE WITH A SPATIAL LOW-PASS FILTER

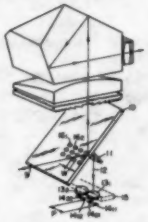
Takashi Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1981, Ser. No. 287,699

Claims priority, application Japan, Aug. 5, 1980, 55-107397

Int. Cl.[4] G01J *1/20;* **G03B** *3/10*

U.S. Cl. 250—204 **9 Claims**



1. A range finding device comprising:

an imaging lens for forming an image of a subject on a photosensitive material;

at least two rows of discrete sensors of a predetermined pitch disposed substantially at a focal plane of said imaging lens, each of said rows of sensors reading substantially the same location of the subject when focusing is achieved and substantially different locations of the subject when focusing is not achieved; and

optical low-pass filter means disposed between said imaging lens and said rows of sensors for lowering a modulation transfer function (an MTF) at a spatial frequency component corresponding to said predetermined pitch so that the MTF is lowered as compared with an MTF at the spatial frequency component in a case where no optical low-pass filter means is provided.

4,641,023

OPTICAL HEAD

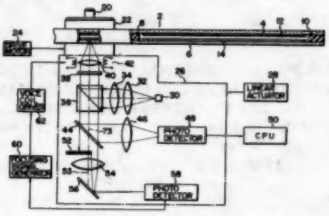
Hideo Ando, and Akihiko Doi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba and Toshiba Automation Equipment Engineering, Ltd., both of Kawasaki, Japan

Filed Nov. 16, 1984, Ser. No. 671,909

Claims priority, application Japan, Nov. 16, 1983, 58-215837; Dec. 1, 1983, 58-227526; Mar. 29, 1984, 59-61878

Int. Cl.[4] H01J *3/14;* **G02B** *7/02*

U.S. Cl. 250—216 **22 Claims**



1. An optical head comprising a beam source for generating a light beam, a base supporting said beam source mounted thereon and having a linear expansion coefficient α, a frame supporting said base secured thereto and having a linear expansion coefficient γ, a lens-barrel disposed in and secured to said frame and having a linear expansion coefficient β, and a collimator lens system disposed in and secured to said lens-barrel for collimating the light beam generated from said beam

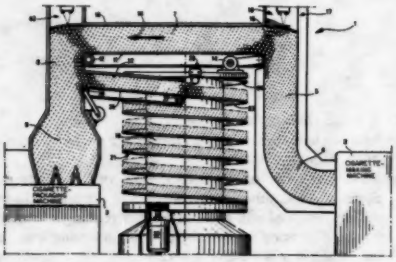
source, said frame being made of a material having a linear expansion coefficient satisfying either one of the inequalities $\alpha \cong \gamma$ and $\beta \cong \gamma$.

4,641,024

CONVEYOR SYSTEM FOR TRANSFERRING A MASS OF BAR SHAPED ARTICLES, IN PARTICULAR CIGARETTES

Armando Neri, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Feb. 23, 1984, Ser. No. 582,733
Claims priority, application Italy, Feb. 24, 1983, 3350 A/83
Int. Cl.[4] G01N 9/04
U.S. Cl. 250—223 R **7 Claims**



1. Conveyor system for transferring a mass of bar shaped articles having longitudinal axes, in particular cigarettes, arranged horizontally and one parallel with the other, from at least one machine on which the articles are made to at least one more machine for packing the articles, provided with conveyor means for supporting and transferring the articles with a movement crosswise to the longitudinal axes thereof, said conveyor means defining a plurality of channels connected one to the other; and at least one device for checking or detecting the quantity of the articles at a given position of said conveyor system, called the checking position, for operating the corresponding drive means of said conveyors, an essential feature of the said conveyor system being that said checking device comprises a transducer of analog type that furnishes an output signal whereby the level trend of the articles in the checking position is checked, said output signal proportional to the distance between the transducer and the surface of the level trend of the said articles at the said checking position.

4,641,025

SYSTEM FOR DETERMINING THE POSITION OF THE BOUNDARY BETWEEN SUBSTANCES HAVING DIFFERENT REFRACTIVE INDICES

Glen E. Miller, Redondo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 5, 1984, Ser. No. 678,294
Int. Cl.[4] H03J 5/16
U.S. Cl. 250—227 **13 Claims**

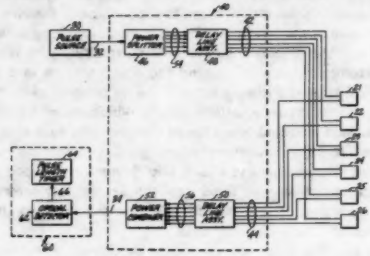
1. An apparatus for determining the position of the boundary between first and second substances having different refractive indices, comprising:

a plurality of N optical sensors positionable along a line that intersects the boundary over a range of boundary positions, each sensor being adapted to vary one of its optical properties depending on whether it is in the first or second substance;

source means for generating an optical source pulse;

interface means responsive to the source pulse for producing an optical response pulse having a time duration proportional to the number of sensors that are in the first substance; and

means for measuring the duration of the response pulse.

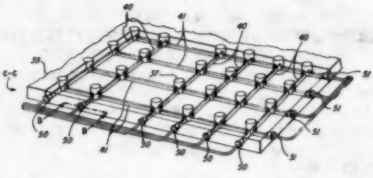


4,641,026

OPTICALLY ACTIVATED KEYBOARD FOR DIGITAL SYSTEM

Felix Garcia, Jr., Round Rock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 2, 1984, Ser. No. 576,225
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—229 **13 Claims**



1. Manual input apparatus having scanning means, for providing inputs to data handling apparatus, comprising:

(a) key housing means having a matrix of apertures formed through the top surface thereof;

(b) wave guide means formed in the key housing means in a matrix configuration of columns and rows with the intersections of the columns and rows aligned below the apertures;

(c) light source means connected to each column, each light source means being turned on and off in a predetermined order by the scanning means;

(d) light detecting means connected to each row, activated by impinging light to provide a signal indicative of detection;

(e) key means resiliently mounted over each aperture and having a plunger for passing through the aperture when a key means is selected and depressed; and

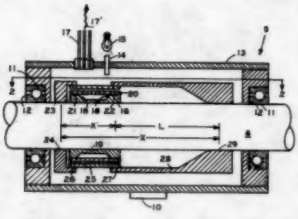
(f) polarizing means formed by each plunger to reflect light, from a light source means that is turned on at a scanned column when the key means has been depressed, through the row at that intersection to the light detecting means associated with that row wherein each plunger is dimensioned so that when the associated key means is depressed, the plunger intrudes into the wave guide means a predetermined distance, defining a volume between the bottom of each plunger and the bottom of the wave guide means to permit light to pass through the volume in the scanned column to allow detection of other depressed keys in the scanned column and associated rows.

4,641,027

INDICATING POSITIONS

G. Frederick Renner; Richard K. Thatcher; William G. Atterbury, all of Columbus; Jeremy M. Harris, Worthington; Nile F. Hartman, Westerville, and Robert B. McCown, Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 18, 1984, Ser. No. 683,120
Int. Cl.[4] H01J *3/14*; G01D *5/34*
U.S. Cl. 250—237 G 36 Claims



1. Apparatus for indicating the relative positions in a given direction between a reference point and a test point spaced therefrom and movable relative thereto, comprising

reference surface means movable in response to movement of the reference point, and having at least a relevant reference portion that is covered with a plurality of substantially equally spaced lines thereon predominantly in a direction normal to the given direction,

test surface means movable in response to movement of the test point, and having at least a relevant test portion that is substantially similar and parallel to the relevant reference portion of the reference surface means, and covered with a plurality of substantially equally spaced lines thereon predominantly in a direction normal to the given direction,

the relevant portion of each surface means being adjacent and overlapping the relevant portion of the other surface means throughout a useful range of relative positions, and at least one relevant portion being substantially transparent between the lines thereon, and

means for illuminating the relevant portions to form moire fringes,

the reference surface means and test surface means being so arranged that relative movement between the test point and the reference point having a component in the given direction varies the angle between the lines on the relevant portions of the respective surface means and thus causes the spacing of the moire fringes formed by the lines to vary as a function of the relative positions between the reference point and the test point in the given direction.

4,641,028

NEUTRON LOGGING TOOL

James A. Taylor, 4213 Bonham, Odessa, Tex. 79762, and Kenneth G. Taylor, 926 W. 38th, Odessa, Tex. 79764

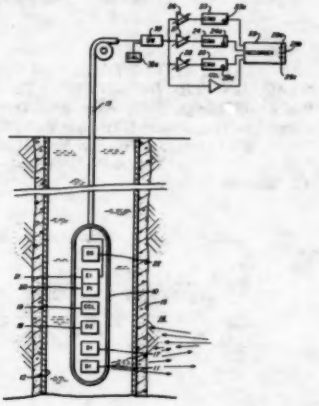
Filed Feb. 9, 1984, Ser. No. 578,710
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—266 12 Claims

1. A method of logging earth formations traversed by a well bore and utilizing a logging tool having a neutron source and a short spaced and a long spaced thermal neutron detector which produce an independent response as a function of depth of the logging tool in a well bore, comprising the steps of:

moving the logging tool through a well bore to locate a section of the earth formations which has minimum porosity and obtaining measurement responses from each of said long and short spaced detectors;

normalizing the responses of the long and short spaced detectors by matching the sensitivity of response of the long spaced detector to the sensitivity of response of the short spaced detector for an earth formation which has minimum porosity so that the normalized responses track one another in an earth formation which has minimum porosity;

moving the tool over the length of the well bore to be surveyed while recording the normalized responses of the long and short spaced neutron detectors as a function of depth;



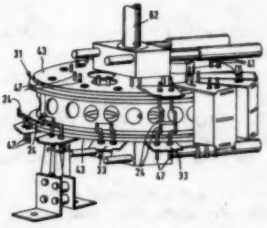
comparing the normalized responses of the long and the short spaced neutron detectors on the basis that the normalized responses match for dense and low porosity formations and that a hydrocarbon bearing formation is indicated when the long spaced response is less than the short spaced response and that a water bearing formation is indicated when the long spaced response is greater than the short spaced response.

4,641,029

PROCESS AND APPARATUS FOR HEATING IONIZING STRIPS

Karl-Eugen Habfast, Kieselbachstr. 26, D - 2800 Bremen 41; Günter Kappus, Mecklenburgerstr. 37, D - 2805 Stuhr 4; Horst Rache, Brookweg 12, D - 2870 Delmenhorst, and Bernd Windel, Wachmannstr. 151, D - 2800 Bremen 1, all of Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,758
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1983, 3329401
Int. Cl.[4] H01J *49/10*
U.S. Cl. 250—288 32 Claims



1. A process for the heating of a plurality of ionizing strips having samples thereon used in mass spectrometers, having an ion emission path, and arranged on a magazine wheel to generate a stable ion emission, comprising the following steps:

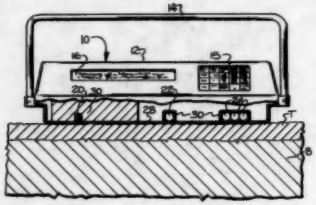
preheating said samples located on the ionizing strips to a specific temperature and holding at this temperature; thereafter, without the heating operation being interrupted heating-up said samples toward an ionizing temperature; and, after said ionizing temperature has been reached subsequently transferring said samples into a measuring position juxtaposed with said ion emission path without the heating operation being interrupted including the period while said transfer is taking place.

4,641,030

APPARATUS AND METHOD FOR DIRECTLY MEASURING THE DENSITY OF A THIN LAYER

Ali Regimand, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Dec. 13, 1984, Ser. No. 681,302
Int. Cl.[4] G01N 23/00
U.S. Cl. 250—308 **7 Claims**



1. A nuclear radiation backscatter gauge for directly measuring from a composite material comprised of a relatively thin top layer of material applied over an underlying base material, the density D_T of the top layer, comprising

means for emitting nuclear radiation from a source into the relatively thin top layer of material and the underlying base material and for detecting radiation which is scattered therefrom at two geometrically differing source-to-detector relationships;

signal processing circuit means for responding to the detected scattered radiation at said two source-to-detector relationships and generating respective signals D_{G1} and D_{G2} representative of the composite densities of the top layer and base layer as measured at the respective source-to-detector relationships, and

signal calculating circuit means connected with said signal processing circuit means and operable for determining the density D_T of the top layer from the relationship

$$D_T = \frac{k_2 D_{G1} - k_1 D_{G2}}{k_2 - k_1},$$

where k_2 and k_1 are empirically derived instrument constants.

4,641,031

ION SOURCE APPARATUS

Yasuyuki Ito, Yokohama, and Toru Sugawara, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 9, 1985, Ser. No. 689,943
Claims priority, application Japan, Feb. 13, 1984, 59-22732
Int. Cl.[4] H01J 27/00
U.S. Cl. 250—423 R **8 Claims**

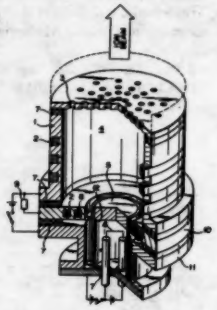
1. An ion source apparatus comprising:

a bulk type thermionic cathode which, when heated, emits thermoelectrons;

an anode which causes a discharge in cooperation with said thermionic cathode, thereby producing a plasma;

a grid electrode for extracting ions out of said plasma;

a mangetic member for confining said plasma within a prescribed region; and



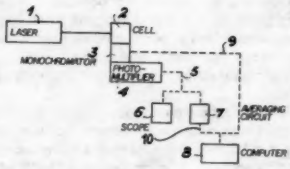
a ferromagnetic body surrounding said thermionic cathode for eliminating lines of magnetic force created by said magnetic member in proximity to the surface of said thermionic cathode.

4,641,032

PROCESS FOR THE DETERMINATION OF TRACES OF URANIUM IN SOLUTION BY TIME RESOLUTION SPECTROFLUORIMETRY

Patrick Mauchien, Orsay, and Philippe Cauchetier, Massy, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 15, 1985, Ser. No. 712,175
Claims priority, application France, Mar. 16, 1984, 84 04094
Int. Cl.[4] G01N 21/64
U.S. Cl. 250—459.1 **2 Claims**



1. A process for the determination of traces of uranium in solution consisting of the steps of exciting the fluorescence of the uranium molecules in the solution by laser pulses, studying the exponential decay curve of said fluorescence for a given wavelength, deducing the value, F_0, of said same fluorescence at the end of each laser pulse and comparing the deduced value with the value, F'_0, obtained for a standard uranium solution containing a known uranium quantity.

4,641,033

APPARATUS AND METHOD PREVENTING RADIATION INDUCED DEGRADATION OF OPTICAL ELEMENTS

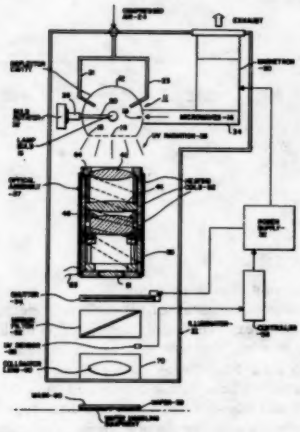
Andrei N. Petelin, Rockville; Celia M. Sharp; Michael G. Ury, both of Bethesda, all of Md., and Gene R. Wooden, Sterling, Va., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Dec. 19, 1984, Ser. No. 683,521
Int. Cl.[4] G21G 1/00
U.S. Cl. 250—492.1 **16 Claims**

1. In an optical apparatus for transmitting ultraviolet radiation from a source of said ultraviolet radiation to a target to be exposed to said ultraviolet radiation;

an optical system having at least one optical element com-

prising a radiation transmissive silica which upon exposure to said ultraviolet radiation at ambient temperature becomes degraded by an absorption of at least one wavelength of said ultraviolet radiation that increases with the time of said exposure, and which upon being annealed at a temperature in the range of about 300° C. to about 400° C. reverses said degradation by a decrease in said absorption; and,



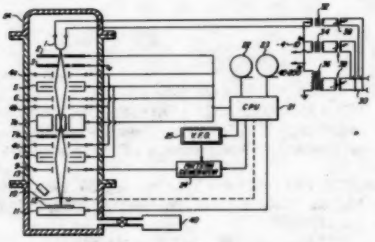
heating means for maintaining said optical element at an elevated temperature in the range of about 280° C. to about 400° C. substantially at all times during transmission of said ultraviolet radiation by said optical system, said elevated temperature being sufficiently high to prevent a significant amount of said degradation.

4,641,034

ION IMPLANTATION APPARATUS AND METHOD FOR MASKLESS PROCESSING

Shigeru Okamura, Ebina, and Takao Taguchi, Isehara, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 28, 1984, Ser. No. 687,225
Claims priority, application Japan, Dec. 29, 1983, 58-251453
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—492.2 **7 Claims**



1. A method of processing a substrate by selective ion implanting directly to patterns on the substrate using a focused ion beam without using masks and scanning a focused ion beam in a step by step movement, said method comprising the steps of:

determining the starting and ending points of said scanned substrate

measuring an ion beam current by a probe;

selecting a clock frequency from an output frequency of a variable frequency oscillator whose frequency can be varied continuously, said clock frequency for scanning said focused ion beam in a step by step movement and a scanning number based upon said measured ion current for providing a predetermined dosage; and

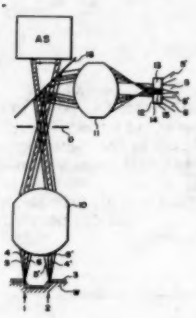
performing said processing of said substrate with said ion beam by the selected combination of said clock frequency and said scanning number.

4,641,035

APPARATUS AND A METHOD FOR POSITION DETECTION OF AN OBJECT STEPPED PORTION

Akiyoshi Suzuki, Tokyo, and Hideki Ina, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1984, Ser. No. 642,760
Claims priority, application Japan, Aug. 31, 1983, 58-159652
Int. Cl.[4] G01N *21/86*; G01V *9/04*
U.S. Cl. 250—548 **8 Claims**



1. An apparatus for detecting a position of an object having a stepped portion and having a substantially transparent surface layer, comprising:

illuminating means for illuminating the object with light, so that light is scattered by the stepped portion, and so that light is reflected by the object and then refracted by the transparent layer;

sensing means for sensing light that has been scattered by the stepped portion in such a direction as not to be influenced by light reflected by the object and then refracted by the transparent layer; and

detecting means for detecting a position of the object on the basis of an output of said sensing means.

4,641,036

METHOD OF AND APPARATUS FOR IMAGING SURFACE OF OBJECT AT HIGH TEMPERATURE

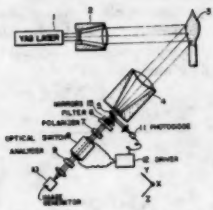
Jiro Ohno, and Hirokatsu Yashiro, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 652,946
Claims priority, application Japan, Sep. 24, 1983, 58-176748
Int. Cl.[4] G01N *21/00*
U.S. Cl. 250—574 **5 Claims**

4. An apparatus for imaging the surface of an object at high temperature, comprising:

a light pulse generator provided such as to be opposed to high-temperature object; and

a half-mirror for dividing light, an interference filter, a high-speed optical switch and an image generating mechanism



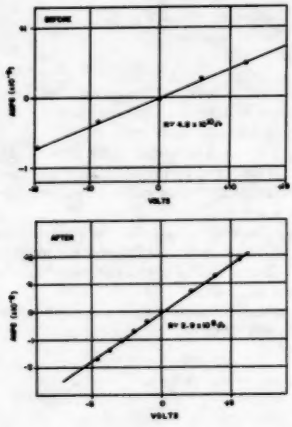
which are successively disposed on the optical axis of light which is reflected from said object.

4,641,037

ORGANIC METAL NEUTRON DETECTOR

Michael A. Butler, and David S. Ginley, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 21, 1984, Ser. No. 673,969
Int. Cl.[4] G01T 3/00
U.S. Cl. 250—390 17 Claims



1. A device for detection of neutrons, comprising:

as an active neutron sensing element, a conductive organic polymer having both electrical conductivity and a cross-section for said neutrons such that a detectable semipermanent change in said conductivity is caused through impingement of said neutrons on the organic polymer;

means operatively associatable with said conductive organic polymer, which is responsive to a property of said polymer altered by impingement of said neutrons on said polymer; and

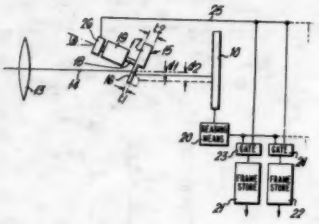
means for associating a permanent or semi-permanent change in said conductivity with the presence of neutrons at the location of said device.

4,641,038

IMAGING DEVICE

Mark G. B. Baker, Edinburgh, Scotland, assignor to Ferranti, plc, Cheshire, England

Filed Jun. 22, 1983, Ser. No. 507,677
Claims priority, application United Kingdom, Jun. 24, 1982, 82185550
Int. Cl.[4] H01J 40/14; H04N 3/12
U.S. Cl. 250—578 18 Claims



1. An imaging device including:

a two-dimensional array of photoelectric elements spaced apart in at least one coordinate direction of the array,

focusing means operable to produce an image of a subject in a focal plane at the array elements,

a substantially planar member arranged to be rotated about an axis and having first and further discrete parallel-faced optically transmissive portions disposed circumferentially about the rotation axis,

said portions being movable one at a time through the field of view of the photoelectric elements such that with the first portion thereof in said field of view of the elements a first part of the image is caused to fall upon the elements and with each further portion thereof in the field of view of the elements the image is displaced with respect to the first part in said one coordinate direction to cause a different part of the image associated with each portion to fall upon the elements.

4,641,039

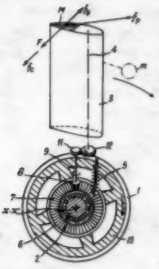
WIND MOTORS AND AEROGENERATORS

Jean Carre, Mailly-la-Ville, France, assignor to Groupment d'Interet Economique Aerogenerateurs Carre, Mailly-la-Ville, France

PCT No. PCT/FR83/00268, § 371 Date Aug. 30, 1984, § 102(e) Date Aug. 30, 1984, PCT Pub. No. WO84/02752, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 30, 1983, Ser. No. 648,174
Claims priority, application France, Dec. 30, 1982, 82 22121; Jun. 8, 1983, 83 09486
Int. Cl.[4] F03D 7/04
U.S. Cl. 290—44 20 Claims

1. Aerogenerator or wind-powered engine comprising a rotor with variable-pitch propeller, wherein the blades (3) are mounted to pivot about their respective axes (4), whilst being dynamically out-of-balance and consequently presenting an out-of-balance or disturbing rear mass (M), wherein it comprises compensating means sensitive to the deceleration of the

rotor in order automatically to exert on each blade, in the event of deceleration of the rotor, a force substantially equal to and



opposing the disturbing force created by the kinetic energy of the rear or out-of-balance mass of the blade.

4,641,040

LOW-HEAD HYDROELECTRIC INSTALLATION

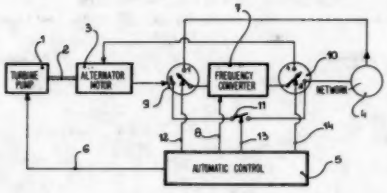
Lucien Megnint, Grenoble, France, assignor to Neyrpic, Grenoble, France

Filed Feb. 25, 1985, Ser. No. 704,981

Claims priority, application France, Feb. 24, 1984, 84 02814

Int. Cl.⁴ H01D *15/10*

U.S. Cl. 290—52 **5 Claims**



1. In a low-head hydroelectric installation, of the type including at least one hydraulic turbo-machine (1) constructed to give optimum efficiency under a defined head of water or pressure head (Hn), called the nominal head, corresponding to a nominal power (Pn) of the installation and for a speed of rotation corresponding to the speed of synchronism (ns) with the frequency of an electric network (4), and at least one rotary electrical machine (3) drive-coupled to said turbo-machine and electrically connected to said network, the improvement comprising

automatic control means (5) enabling rotation of said turbo-machine at its speed of synchronism with the frequency of said network, comprising means (5, 9 to 11) making it possible, when said head of water or pressure head is less than a value (Hd) equal to a defined fraction less than one-half of said nominal head (Hn), to cause said turbo-machine to rotate at a speed lower than said synchronous speed, and consequently to insert between said network and said electrical machine a frequency matching device (7) of maximum power at least less than one-half of said nominal power.

4,641,041

CIRCUIT ARRANGEMENT FOR REGISTERING FALSE RELEASE SIGNALS FOR A RESTRAINT SYSTEM

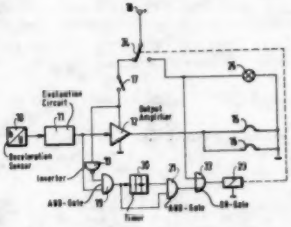
Bernhard Mattes, Sachsenheim; Eberhard Mausner, Linz, and Wadym Suchowerskyj, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 19, 1985, Ser. No. 746,297

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425281

Int. Cl.⁴ B60R *21/08*; H01H *35/14*

U.S. Cl. 307—10 R **7 Claims**



1. A circuit arrangement for registering false release signals for a restraint system in a motor vehicle wherein the restraint system includes first release circuit means for generating a first release signal in response to an accident-related deceleration of the vehicle, said first release circuit means including a first deceleration sensor and an evaluation circuit connected to the latter; second release circuit means for responding to a predetermined threshold level of deceleration by generating a second release signal; and, actuating circuit means for actuating said restraint system in response to said first release signal only upon the occurrence of said second release signal simultaneoulsy with said first release signal; said circuit arrangement for registering false release signal comprising:

monitoring circuit means connected to said evaluation circuit for ascertaining the occurrence of said first release signal in the absence of said second release signal from said second release circuit means; and,

warning means responsive to the output of said monitoring circuit means for registering the presence of said first release signal in the absence of said second release signal from said second release means thereby establishing said first release signal occurring in this manner as a false release signal.

4,641,042

POWER SUPPLY SYSTEM AND A CONTROL METHOD THEREOF

Yoshiaki Miyazawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 20, 1985, Ser. No. 735,738

Claims priority, application Japan, May 25, 1984, 59-104688

Int. Cl.⁴ H02J *3/06, 9/06*

U.S. Cl. 307—66 **17 Claims**

1. A power supply system, comprising:

inverter means for converting a DC power into a first AC power;

reserved power source means for generating a second AC power;

changeover means, connected to receive said first AC power and said second AC power, for outputting one of said first and second AC power, said changeover means being adapted to supply a current to a load;

overcurrent detection means for detecting said load current, comparing the detected load current with a predetermined detection level to produce an overcurrent detection signal having a first level when said load current is less

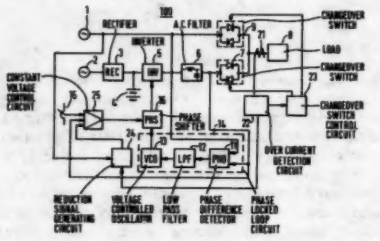
than said predetermined detection level and a second level when said load current is equal to or greater than said predetermined detection level;

means for controlling a frequency and phase of said first AC power to coincide with a frequency and phase, respectively, of said second AC power and controlling a voltage of said first AC power to be a specified voltage, said specified voltage being determined to be a predetermined reference voltage when said overcurrent detection signal is at said first level and to be a reduced voltage that is between zero voltage and a voltage of said second AC power when said overcurrent detection signal is at said second level;

said changeover means being further connected to receive said overcurrent detection signal, and for outputting said first AC power when said overcurrent detection signal is at said first level and outputting said second AC power when said overcurrent detection signal is at said second level.

12. A method for controlling a power supply system, including,

inverter means for converting a DC power into a first AC power,



reserved power source means for generating a second AC power,

changeover means connected to receive said first AC power and said second AC power for outputting one of said first and second AC power, said changeover means being adapted to supply a load current to a load, and

control circuit means connected to receive said first AC power, said second AC power and a reference voltage for controlling said first AC power such that a phase, a frequency and a voltage of said first AC power coincide with a phase and a frequency of said second AC power, and said reference voltage, respectively,

said method comprising the steps of:

detecting whether or not said load current exceeds a predetermined detection level; and

supplying said load current from said reserved power source means and stopping supplying said load current from said inverter means by controlling said changeover means and reducing the voltage of said first AC power to a specified reduced voltage when said load current exceeds said predetermined detection level.

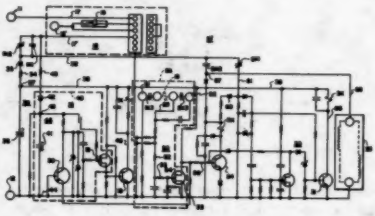
4,641,043

PRINTED WIRING BOARD MEANS WITH ISOLATED VOLTAGE SOURCE MEANS

John T. Adams, and John E. Bohan, Jr., both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 12, 1985, Ser. No. 775,287
Int. Cl.[4] H01H *37/00*; F23N *23/00*
U.S. Cl. 307—117 **10 Claims**

1. An ignition control device that includes flame rectification sensing circuit means that responds to a very small flame rectification signal, including: printed wiring board means that has an insulated surface that in turn supports a plurality of conductive areas; electronic components mounted upon said printing wiring board means, and electrically interconnected by said conductive areas to provide an electronic circuit for said control device; said electronic components in part providing said flame rectification sensing circuit means which is connected to flame rod means to respond to the presence or absence of a flame; said ignition control device including power supply means having positive voltage source means and negative voltage source means; a first area on said printed wiring board means including said flame rectification sensing circuit means; a second area on said printed wiring board



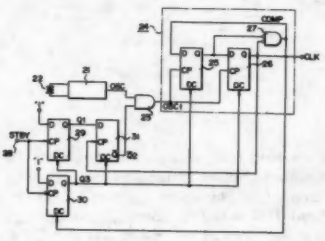
means including said negative voltage source means; and said positive voltage source means being connected to and including a portion of said conductive areas with at least some said conductive areas of said positive voltage source means portion being placed between said first and said second areas to prevent unwanted migration of negative potential from said negative voltage source means to said flame rectification sensing circuit means to prevent said negative potential from falsely causing an indication of the presence of a flame when none is in fact present.

4,641,044

CLOCK GENERATOR WITH RESET AND INITIALIZATION CIRCUITRY

Hajime Shiraishi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1984, Ser. No. 676,318
Claims priority, application Japan, Jan. 25, 1984, 59-11164
Int. Cl.[4] H03K *3/017*
U.S. Cl. 307—269 **6 Claims**



1. A clock generator receiving a pulse signal having a predetermined period comprising:

frequency-dividing means for generating a clock signal by frequency dividing said pulse signal, said frequency-dividing means including a divider clear terminal for receiving a clear signal to set said frequency-dividing means into an initial state;

a control terminal for receiving a control signal to stop said frequency-dividing means from generating said clock signals;

first memory means, having an input terminal coupled to said control terminal, for storing a level of said control signal received at said control terminal and for providing a first memory output signal, said first memory means also

having a first memory clear terminal for receiving said clear signal to set said first memory into an initial state;

second memory means, coupled to said first memory means, for storing said first memory output signal of said first memory means in synchronism with the clock signal generated from said frequency-dividing means and for producing a second memory output signal, said second memory means also having a second memory clear terminal for receiving said clear signal to set said second memory means into an initial state;

controlling means, coupled to receive said pulse signal and said second memory output signal, for supplying said pulse signal to said frequency-dividing means according to the state of said second memory output signal of said second memory means; and

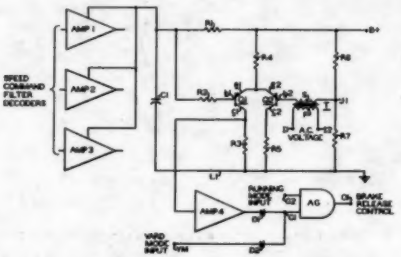
third memory means, having an input terminal coupled to said control terminal, for storing a level of said control signal supplied to said control terminal for restarting the frequency-dividing means in response to said control signal, and for supplying said clear signal to said first and second memory means and said frequency-dividing means.

4,641,045

FAIL-SAFE ONE AND ONLY ONE SIGNAL CHECKING CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to American Standard Inc., McCandless Township, Allegheny County, Pa.

Filed Nov. 13, 1984, Ser. No. 670,243
Int. Cl.⁴ H03K *5/153*
U.S. Cl. 307—350 **10 Claims**



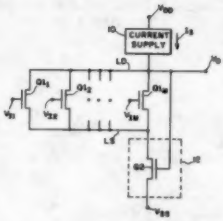
1. A fail-safe checking circuit for assuring the presence of only a single input signal comprising, a differential amplifier having a pair of inputs and an output, said differential amplifier includes a pair of transistors, a pair of biasing networks, one of said pair of biasing networks is connected to the base electrode of one of said pair of transistors and the other of said pair of biasing networks is connected to the base electrode of the other of said pair of transistors, an a.c. signal inductively coupled to one of said pair of inputs to produce signal pulses on said output when the voltage drop across one of said pair of biasing networks is substantially equal to the voltage drop across the other of said pair of biasing networks, and one of said pair of biasing networks includes a resistor which senses the current drawn by a plurality of amplifier-rectifiers and wherein the current through said resistor is designed to be a definite amount to cause the voltage drops across said pair of biasing networks to be substantially equal only when current is drawn by one of said plurality of amplifier-rectifiers.

4,641,046

NOR GATE WITH LOGICAL LOW OUTPUT CLAMP

Scott T. Becker; Michael J. Bergman, both of San Jose, and Shueh-Mien Lee, Sunnyvale, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jun. 17, 1985, Ser. No. 745,475
Int. Cl.⁴ H03K *19/094, 19/20, 5/08*
U.S. Cl. 307—448 **14 Claims**



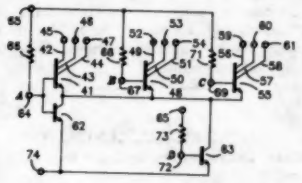
1. A gate having: a plurality of like-polarity enhancement-mode first field-effect transistors (FET's), each of which has a gate electrode for receiving a corresponding input voltage, a source, and a drain; a conductor coupled to the drains for providing an output voltage; a current source coupled between the conductor and a terminal for a first supply voltage; and means coupling the sources to a terminal for a second supply voltage; characterized in that the coupling means includes a clamp that, when at least one of the first FET's is turned on, clamps the output voltage at a value that is largely the same regardless of the number of first FET's turned on.

4,641,047

COMPLEX DIRECT COUPLED TRANSISTOR LOGIC

Mark S. Birrittella, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,312
Int. Cl.⁴ H03K *19/082, 19/091;* **H01L** *27/04*
U.S. Cl. 307—454 **1 Claim**



1. A logic circuit having a supply voltage terminal, a plurality of input terminals and a plurlaity of output terminals, comprising:

a first transistor having a base coupled to one of said input terminals, an emitter, and a plurality of collectors coupled to one each of said plurality of output terminals;

a second transistor having a base coupled to said input terminal, an emitter coupled to said supply voltage terminal, and a collector coupled to said emitter of said first transistor;

a plurality of transistors, each of said plurality of transistors having at least one collector coupled to one each of said plurality of output terminals, an emitter coupled to said emitter of said first transistor, and a base coupled to one of said plurality of input terminals; and

a third transistor having a collector coupled to said emitters of said first transistor and said plurality of transistors, an

emitter coupled to said supply voltage terminal, and a base coupled to one of said plurality of input terminals.

4,641,048

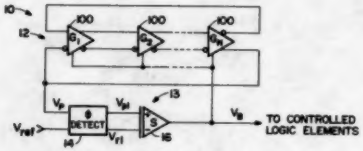
DIGITAL INTEGRATED CIRCUIT PROPAGATION DELAY TIME CONTROLLER

Ira G. Pollock, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 24, 1984, Ser. No. 643,940

Int. Cl.⁴ H03K *5/26*

U.S. Cl. 307—591 **5 Claims**



1. A circuit for monitoring and controlling the propagation delay of logic elements on an integrated circuit comprising:

an oscillator having N logic elements of the integrated circuit connected in series to form a ring with the output of each logic element being connected to the input of the succeeding logic element such that a pulse continuously circulates around the ring, the oscillator logic elements having propagation delay characteristics typical of the other logic elements on the integrated circuit, the output of the oscillator being a phase locking signal having a frequency which is a function of the propagation delay of each logic element of the ring, the propagation delay of the logic elements being in part a function of applied bias voltage; and

a bias signal generator, having as inputs the phase locking signal and a reference signal having a plurality of pulses of frequency Fref, for comparing the phase locking signal to the reference signal to generate a bias signal proportional to the time integral of the phase difference between the phase locking signal and the reference signal, the bias signal being applied to each logic element on the integrated circuit to automatically control the propagation delay of each logic element to be 1/(N×Fref), the logic elements having similar propagation delay times for a given applied bias signal.

4,641,049

TIMING SIGNAL GENERATOR

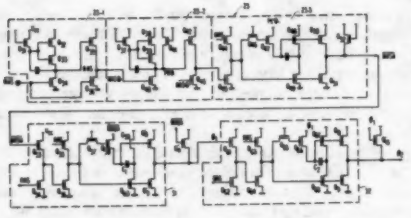
Yukio Fukuzo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,979

Claims priority, application Japan, Nov. 11, 1983, 58-211791

Int. Cl.⁴ H03K *5/13, 17/28*

U.S. Cl. 307—590 **17 Claims**



1. In a timing signal generator of the type having a first dynamic delay circuit adapted to generate a first delay signal in response to a control signal applied to an input terminal thereof, and a second dynamic delay circuit adapted to generate a second delay signal in response to said first delay signal, said first and second dynamic delay circuits sequentially generating said first and second delay signals respectively under the condition of a steady supply of power thereto, said first and second delay signals being generated in a random order when the supply of power is initiated, the improvement comprising a first field effect transistor coupled between the output terminal of said first dynamic delay circuit and a first voltage terminal and having a gate coupled to the input terminal of said first dynamic delay circuit and a second field effect transistor coupled between the output terminal of said second dynamic delay circuit and said first voltage terminal and having a gate coupled to said output terminal of said first dynamic delay circuit, whereby when the supply of power is initiated, the output terminal of said first dynamic delay circuit first generates said first delay signal in response to the control signal at said input terminal thereof and thereafter the output terminal of said second dynamic delay circuit generates said second delay signal.

4,641,050

ELECTRODYNAMIC SHAKERS

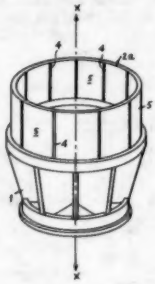
Andrew C. Emerson, Royston, and Stephen A. Foster, Clophill, both of England, assignors to Ling Dynamic Systems Limited, Hertfordshire, England

Filed Jan. 18, 1985, Ser. No. 692,756

Claims priority, application United Kingdom, Mar. 20, 1984, 8407248

Int. Cl.⁴ H02K *33/00, 35/00*

U.S. Cl. 310—27 **4 Claims**



1. An armature structure for an electrodynamic shaker comprising an armature support, an armature coil assembly comprising at least one conductor wound into the armature coil mounted on the support, and a cladding of carbon fibers of the armature coil assembly, said cladding having the carbon fibers disposed generally longitudinally of the armature coil assembly, that is to say, said fibers lie along the direction of motion of the armature.

4,641,051

ROTOR FOR AN ELECTRICAL MACHINE WITH AXIAL AND RADIAL COOLING CHANNELS

Herbert Auinger, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,093

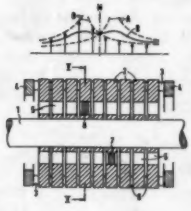
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1984, 3408986

Int. Cl.⁴ H02K *9/14*

U.S. Cl. 310—61 **10 Claims**

7. A rotor for an electrical machine with axial and radial

cooling channels, having equally wide radial cooling channels and equally wide axial cooling channels arranged symmetrically relative to the rotor axis between the rotor metal laminations, so that the cooling air that blows towards an outer radial surface of the rotor is conducted to the axial cooling channels



from both frontal sides of the rotor, characterized by having a plurality of blocking surfaces, each arranged in one of the axial cooling channels respectively at an axial distance from the rotor center and alternating first toward one of the frontal sides and then the other frontal side from the rotor center between respective adjacent axial cooling channels.

4,641,052

INPUT CIRCUIT FOR A STACKED TYPE PIEZO-ELECTRIC ELEMENT DEVICE

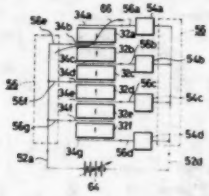
Noboru Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 14, 1985, Ser. No. 733,913

Claims priority, application Japan, Nov. 1, 1984, 59-229016

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—317 **5 Claims**



1. A stacked type piezo-electric device for converting electrical energy into mechanical energy comprising:

a plurality of stacked piezo-electric elements, each piezo-electric element having electrodes on both sides thereof;

a power circuit;

a plurality of voltage impression circuit means corresponding to each of said piezo-electric elements, for applying a voltage to each of the electrodes of said piezo-electric elements, said plurality of voltage impression circuit means connected in parallel with one another to said power circuit thereby establishing for each piezo-electric element a current path from said power circuit and through said corresponding voltage impression circuit means for causing said conversion of electrical to mechanical energy;

a plurality of circuit breaking means, one of which is connected in the current path of each piezo-electric element for interrupting the current that flows in said current path only when said current exceeds a predetermined value, whereby remaining current, not exceeding said predetermined value, continues to flow in said remaining current paths.

4,641,053

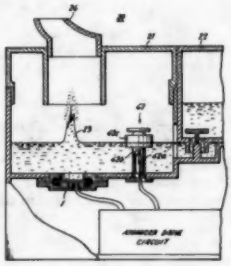
ULTRASONIC LIQUID ATOMIZER WITH AN IMPROVED SOFT START CIRCUIT

Masaaki Takeda, Osaka, Japan, assignor to Matsushita Seiko Co., Ltd., Japan

Filed Aug. 14, 1984, Ser. No. 640,644

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—317 **18 Claims**



1. An apparatus for use with an ultrasonic liquid atomizer having a liquid chamber for holding liquid therein and a piezoelectric vibrator for generating pressure rises in said liquid in response to ultrasonic energy, comprising:

power supply means connected in use to a mains supply for generating a full-wave rectified supply voltage and a bias voltage;

an oscillator having a transistor connected to be biased by said bias voltage and a resonant circuit a part of which is formed by said piezoelectric vibrator, said transistor and said resonant circuit being connected to receive said full-wave rectified supply voltage to generate said ultrasonic energy in said piezoelectric vibrator in the presence of said bias voltage;

a soft start circuit connected in circuit between said power supply means and said transistor for periodically interrupting the supply of said bias voltage to said transistor for variable lengths of time during an initial brief interval from the time said bias voltage is applied to said transistor so that the ultrasonic energy occurs in a series of bursts which increase gradually in duration as a function of time during said initial brief interval; and

a bias stabilizer effective upon the termination of said initial brief period for preventing said soft start circuit from responding to an unwanted voltage generated by said oscillator.

4,641,054

PIEZOELECTRIC ELECTRO-ACOUSTIC TRANSDUCER

Daisuke Takahata, and Yukiyoshi Sakai, both of Kawashima, Japan, assignors to Nippon Ceramic Company, Limited, Saitama, Japan

Filed Jun. 25, 1985, Ser. No. 748,616

Claims priority, application Japan, Aug. 9, 1984, 59-121408; Nov. 15, 1984, 59-173522; Dec. 19, 1984, 59-192425; Dec. 21, 1984, 59-193720

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—324 **12 Claims**

1. A piezoelectric transducer comprising:

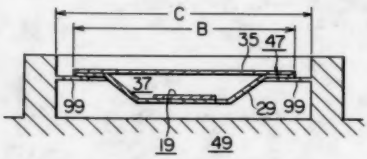
(a) a piezoelectric oscillating assembly comprising a piezoelectric oscillating element comprising a thin piezoelectric plate and electrodes attached to the opposing surfaces of said thin piezoelectric plate;

(b) a first oscillating plate, which is greater in diameter than said piezoelectric oscillating assembly, to which said piezoelectric oscillating assembly is adhered;

(c) a second oscillating plate, which is laid over said first

oscillating plate with the edges thereof substantially sealed together so as to define an acoustically sealed sapce therebetween; and

(d) a support portion defined by said laid over and sealed together portions of said first and said second oscillating



plates, the edge portion of said support portion being defined by at least the edge portion of said first or said second oscillating plate,

wherein the piezoelectric oscillating element is located between said first oscillating plate and said second oscillating plate.

4,641,055

PIEZOELECTRIC RESONATOR WITH NOTCHED SIDES

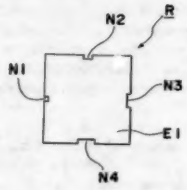
Yasuhiro Tanaka, Ishikawa, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 24, 1986, Ser. No. 842,840

Claims priority, application Japan, Apr. 1, 1985, 60-69551

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—368 **3 Claims**



1. A piezoelectric resonator which comprises a piezoelectric substrate of a quadrilateral configuration, and electrode layers provided over opposite main faces of said piezoelectric substrate, said piezoelectric substrate being formed, in four side edges thereof, with notched portions, said notched portions having dimensions and shapes different from each other.

4,641,056

PLASTIC-BASED AUTOMOTIVE HEADLAMP

Rudolf Sanders, and Josephus F. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,402

Claims priority, application Netherlands, Oct. 12, 1984, 8403115

Int. Cl.[4] H01J *5/60*; H01G *5/14*

U.S. Cl. 313—51 **10 Claims**

1. An electric lamp having a flanged cap mounting, comprising

a translucent lamp vessel having a pinch seal,

an electrical element arranged within said vessel,

electrical current conductors connected to said element and passing from said vessel,

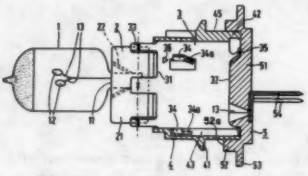
a metal clamping plate having an opening in which the pinch seal is held, and a substantially circular-cylindrical collar,

a substantially circular-cylindrical metal sleeve having first and second ends, joined telescopically at said first end to said collar and rigidly secured thereto,

a cup-shaped lamp cap of synthetic material in which said second end is fixed; and which has a bottom portion, a substantially cylindrical wall portion, a mounting flange extending from an outer surface of said wall portion, and, to the side of the flange facing the vessel, a circumferential groove for receiving a sealing ring, and

electrical contacts connected to said current conductors and secured to said bottom portion,

characterized in that said cap comprises a first substantially circular-cylindrical hollow body formed of synthetic material, and having a circumferential ridge; and a second



body of synthetic material rigidly connected to said first body, and having a disc-shaped portion having an upright edge surrounding said first body at a first end thereof, and a projecting flange forming said mounting flange; said upright edge having an end surface, said end surface and said circumferential ridge forming opposed walls of said circumferential groove; said first and second bodies being rigidly connected to each other, and

said metal sleeve and said first body including cooperating means for locking said sleeve to said first body against displacement.

4,641,057

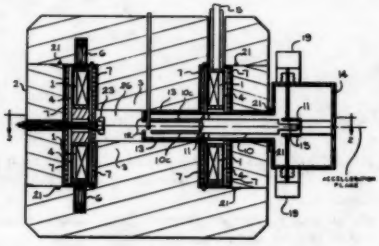
SUPERCONDUCTING SYNCHROCYCLOTRON

Henry G. Blosser, and Bruce F. Milton, both of East Lansing, Mich., Jack Riedel, deceased, late of East Lansing, Mich.; Margaret Riedel (executrix) assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jan. 23, 1985, Ser. No. 693,859

Int. Cl.[4] H05H *13/02*

U.S. Cl. 313—62 **11 Claims**



1. In a synchrocyclotron apparatus including source means on the central axis (a—a) inside an acceleration chamber for providing atomic or subatomic charged particles to be spirally accelerated in the cyclotron, with electrical coils around two spaced apart iron magnetic poles, RF generator means connected to an RF accelerating electrodes for accelerating the charged particles synchronously in the acceleration chamber to generate a pulsed beam of the atomic or subatomic particles from the spirally accelerated charged particles, the improvement which comprises:

(a) a pair of superconducting coils mounted on the poles inside a vessel for containing a liquified gas at about 0° K. to cool the coils;

(b) electrical supply means for providing a large electrical

current through the coils to create a high magnetic field between the poles;

(c) liquid supply means for providing liquified gas to the coils and vessels; and

(d) support means for holding the coils in position around the poles which thermally insulate the coils from the magnetic poles.

4,641,058

ELECTRON GUN

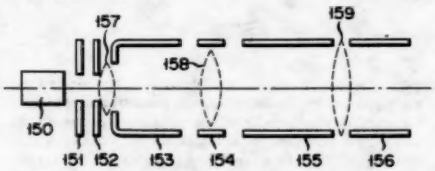
Shinpei Koshigoe, and Takeshi Fujiwara, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 508,534, Jun. 28, 1983, abandoned. This application Jan. 3, 1986, Ser. No. 815,320

Claims priority, application Japan, Jul. 5, 1982, 57-115447

Int. Cl.[4] H01J *29/46, 29/50*

U.S. Cl. 313—449 **12 Claims**



1. An electron gun arrangement, comprising:

a cathode for generating an electron beam; and

first, second, third and fourth grids, in order of increasing distance from said cathode, the cathode, first grid and second grid constituting a triode, each grid having an opening therein through which said electron beam can pass, said second and third grids together functioning to provide a first asymmetrical electron lens having a focusing action that is stronger along a vertical direction than along a horizontal direction, said third and fourth grids together functioning to provide a second asymmetrical electron lens having a focusing action that is stronger along said horizontal direction than along said vertical direction.

7. An electron gun arrangement, comprising:

a cathode for generating an electron beam; and

first, second, third, fourth, fifth and sixth grids, in order of increasing distance from said cathode, the cathode, first grid and second grid constituting a triode, each grid having an opening therein through which said electron beam can pass, said second and third grids together functioning to provide a first asymmetrical electron lens having a focusing action that is stronger along a vertical direction than along a horizontal direction, said fifth and sixth grids together functioning to provide a second asymmetrical electron lens having a focusing action that is stronger along said horizontal direction than along said vertical direction.

4,641,059

CATHODE RAY TUBE

Hiroji Sumiyoshi, Tokyo, and Teiji Arae, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,392

Claims priority, application Japan, Mar. 17, 1984, 59-51566

Int. Cl.[4] H01J *31/00;* **H04N** *5/65*

U.S. Cl. 313—477 R **2 Claims**

1. A cathode ray tube of the type which comprises a tube body having a face plate, and a safety panel bonded to the front surface of the face plate through an interlayer of a cured adhesive resin composition, said adhesive resin composition comprising an unsaturated alkyd resin obtained from an unsaturated dicarboxylic acid and a dihydric alcohol, a polymerizable monomer capable of dissolving the unsaturated alkyd resin, an organic peroxide catalyst, an organometal compound accelerator, and a chelating agent for the metal in the organometal compound accelerator, said chelating agent being a 1,3-diketone selected from the group consisting of acetylacetone and acetylbenzoylmethane and being present in an amount of 0.05 to 3.0 parts, by weight, for each 100 parts of said resin.

4,641,060

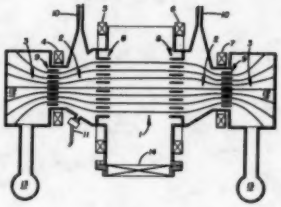
METHOD AND APPARATUS USING ELECTRON CYCLOTRON HEATED PLASMA FOR VACUUM PUMPING

Raphael A. Dandl, San Marcos, Calif., assignor to Applied Microwave Plasma Concepts, Inc., Encinitas, Calif.

Filed Feb. 11, 1985, Ser. No. 700,046

Int. Cl.[4] H01J *7/24;* **H05B** *31/26*

U.S. Cl. 315—111.71 **18 Claims**



1. A method of producing a gas pumping plasma within an evacuated enclosure having a collimating system consisting of baffle structures and a magnetic field having a central uniform region connected to a source of neutral gas to be pumped, a magnetic mirror intermediate region and a terminating divergent region, comprising the steps of evacuating the enclosure to a selected pressure, feeding high frequency microwave energy of a selected power and frequency into the magnetic mirror intermediate region, establishing the magnetic field at a strength such that an electron cyclotron frequency is made equal to the frequency of the microwave energy within the intermediate region, the electrons within the magnetic mirror intermediate region being heated by the microwave energy up to 100 electron volts, the heated electrons ionizing the neutral gas in the intermediate and central regions, and thereby creating and maintaining a pumping plasma in the intermediate and central regions, providing baffle structures between the central and intermediate regions and between the intermediate and terminal regions, thereby permitting unobstructed flow of plasma along the magnetic field lines to the terminal region while restricting the inward flow of neutral gas resulting from recombination in the terminal region, the plasma being composed of ionized neutral gas from the central and intermediate regions, and maintaining an adequate neutral gas concentration in the intermediate region by controlled supply of make-up gas.

6. In a plasma vacuum pump assembly for producing a gas pumping plasma within an evacuated enclosure including means for developing a magnetic field having a central uniform region connected to a source of neutral gas to be pumped, magnetic mirror means forming a magnetic mirror intermediate region and a terminating divergent region, and a collimating system consisting of baffle structures, the combination comprising means for evacuating the enclosure to a selected pressure, means for feeding high frequency microwave energy of a selected power and frequency into the magnetic mirror intermediate region, means for establishing the magnetic field at a strength such that an electron cyclotron frequency is made equal to the frequency of the microwave energy within the intermediate region, the electrons within the magnetic mirror intermediate region being heated by the microwave energy up to 100 electron volts, the heated electrons ionizing the neutral gas in the intermediate and central regions, and thereby creating and maintaining a pumping plasma in the intermediate and central regions, baffle structures arranged respectively be-

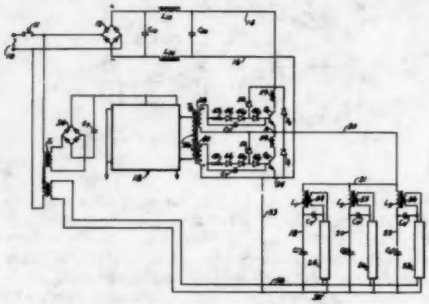
tween the central and intermediate regions and between the intermediate and terminal regions for permitting unobstructed flow of plasma along the magnetic field lines to the terminal region while restricting the inward flow of neutral gas resulting from recombination in the terminal region, the plasma being composed of ionized neutral gas from the central and intermediate regions, and means for controlling a supply of make-up gas in the intermediate region for maintaining an adequate neutral gas concentration therein.

4,641,061

SOLID STATE BALLAST FOR GASEOUS DISCHARGE LAMPS

Robert D. Munson, Tupelo, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 22, 1985, Ser. No. 725,849
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—210 **10 Claims**



1. A solid state ballast for starting and operating a gaseous discharge lamp comprising a D.C. power source voltage a series LC circuit, a coupling capacitor coupling said lamp to said series LC circuit so as to apply the voltage existing across said series capacitor across said lamp, inverter means for driving said series LC circuit at said DC power source voltage and at a selected frequency, said selected frequency being sufficiently high to develop a voltage across said series capacitor adequate to start conduction through said lamp but being substantially below the resonant frequency of said LC circuit, and the value of said coupling capacitor being such that its added reactance after conduction through said lamp is started lowers the resonant frequency of said series LC circuit substantially below said selected frequency.

4,641,062

METHOD AND APPARATUS FOR ADJUSTING THE STATIC CONVERGENCE AND PURITY OF COLOR TELEVISION TUBES

Claude Pons, Grottaferrata, Italy, assignor to Videocolor, Montrouge, France

Continuation of Ser. No. 603,046, Apr. 23, 1984. This application Oct. 17, 1985, Ser. No. 787,717
Claims priority, application France, Apr. 26, 1983, 83 06832
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—368 **2 Claims**

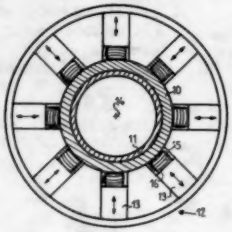
1. Apparatus for adjusting purity and static convergence of a color television tube having a magnetizable ring encircling the neck thereof, comprising:

a plurality of bearing members each displaceable perpendicularly to the longitudinal axis of the tube, each of the bearing members having a core extending from one end thereof;

a corresponding plurality of coils wound around the cores of the bearing members in a one-to-one relationship;

an energization means connected to each of the coils for energizing the coils to produce magnetic poles within the magnetizable ring; and

electromagnetic bi-directional actuating means connected to the bearing members for individually radially displacing each of the coils and cores against the periphery of the magnetizable ring and in constant contact therewith, irrespective of the diameter of the ring, during the purity



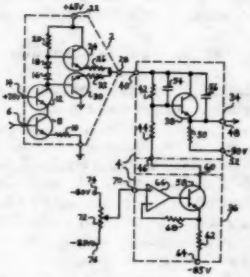
and convergence adjustments, even after repeated adjustments, so that the relationship between currents applied to the coils and the intensity of magnetization is constant, the actuating means further withdrawing each of the bearing members radially away from the periphery of the magnetizable ring after the completion of the adjustments, thereby facilitating easy removal of the apparatus.

4,641,063

VIDEO DRIVER LEVEL SHIFTER

Yosif Smushkovich, 1830 N. La Brea Ave. #2, Los Angeles, Calif. 90046

Filed Dec. 10, 1985, Ser. No. 807,324
Int. Cl.[4] H01J *29/52;* H04N *5/57*
U.S. Cl. 315—383 **6 Claims**



1. For use in combination with a video amplifier for driving a display device such as a cathode ray picture tube, a dynamic level shifting circuit comprising:

a current-controlled voltage source (CCVS) having a signal input terminal receiving a video signal from a video amplifier, a signal output terminal connected to a control element of a display device, a power supply terminal connected to a first d.c. power source, and a current control input terminal; and

a voltage-controlled current source (VCCS) having a control voltage input terminal, a power supply terminal connected to a second d.c. power source, and a current control output terminal, connected to the current control input terminal of said CCVS.

wherein said CCVS is enabled to develop a d.c. offset voltage between its signal input terminal and its signal output terminal, the offset voltage being made proportional to a control current applied to said CCVS at its current input

terminal thru its connection to the current control output terminal of said VCCS, the control current being made proportional to a d.c. control voltage applied to the control voltage input terminal of said VCCS.

whereby the d.c. offset voltage, proportionally controlled by the d.c. control voltage, is made to become superimposed onto the video signal received by the CCVS to provide a level-shifted replica of the video signal for application to the control element of the display device.

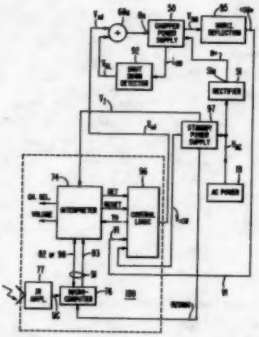
whereby the video amplifier, being thus relieved of conventional requirements to provide reserve dynamic signal output range for level-shifting purposes, may be design-optimized for wider bandwidth than was available conventionally.

4,641,064

TELEVISION POWER SUPPLY SHUTDOWN CIRCUIT

William J. Testin, Indianapolis, Ind., and Michael P. French, Huntsville, Ala., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 29, 1985, Ser. No. 728,657
Int. Cl.[4] H01J *29/70*; H04N *5/68*
U.S. Cl. 315—411 **16 Claims**



1. A television power supply source with a fault protection comprising:

an input energizing voltage source;

a main power supply coupled to said input energizing voltage that selectively operates in a power-up mode and in a shut-down mode, for generating from said input energizing voltage in said power-up mode a normal operating level of a first supply voltage, wherein when said power supply is in said shut-down mode, the level of said first supply voltage is lower than in said power-up mode, said power supply being responsive to first and second control signals for assuming said shut-down mode when either said first or second control signal is generated;

a fault detector for generating said first control signal when a fault condition occurs;

means responsive to said first control signal for causing said power supply to assume said shut-down mode only for a first interval after said fault condition has occurred;

periodic sampling means that periodically samples said first supply voltage for generating said second control signal therefrom; and

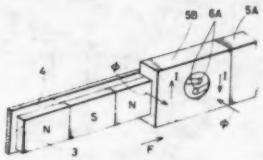
means responsive to said second control signal for maintaining said power supply in said shut-down mode after the end of said first interval so as to prevent said power supply from subsequently assuming said power-up mode.

4,641,065

MOVING COIL TYPE LINEAR MOTOR

Osamu Shibuki, Nagoya; Noboru Matsuyama, Handa; Yoshiaki Nagasawa, Toyota; Katsuhiro Kawai; Shigeru Sakagami, both of Nagoya, and Toshiaki Onoyama, Nishio, all of Japan, assignors to Toyota Shatai Kabushiki Kaisha, Kariya, Japan

Filed May 14, 1985, Ser. No. 733,775
Claims priority, application Japan, May 16, 1984, 59-71491[U]; Sep. 11, 1984, 59-137508[U]; Sep. 19, 1984, 59-141734[U]; Sep. 21, 1984, 59-144056[U]; Dec. 3, 1984, 59-183839[U]; Dec. 10, 1984, 59-186955[U]
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **11 Claims**



1. A moving coil type linear motor comprising a stator rail of generally U-shaped cross-section having a speed signal collector pattern, a permanent magnet having the shape of a flat plate and being magnetized in the direction of its thickness, said permanent magnet being provided on an inner side of the rail to provide alternating magnetic poles next to each other, a pair of driver coils arranged in series in the longitudinal direction of the rail with each coil having a length 1.5 times that of the magnetic pole and a space of 0.5 times the length of the magnetic pole in the center thereof, said coils being disposed opposite the permanent magnet and movable along the permanent magnet within the rail, collector brushes provided with the respective coils, a feeder pattern arranged on an inner side of the rail, said feeder pattern being configured with correspondence to the position of the magnetic poles so that electric power is fed to the coils through brushes only when respective active parts of the coils are fully disposed in magnetic flux of the same direction, a speed sensing means for sensing a rate of movement of said driver coils and for providing a speed signal, said speed sensing means being a speed detector coil separate from said drive coils and having speed signal sender brushes contacting and being movable along said collector pattern of said stator rail, and a speed control means for controlling the rate of movement of said driver coils in accordance with said speed signal of the speed sensing means which is fed through said sender brushes and said collector pattern to the speed control means.

4,641,066

CONTROL APPARATUS FOR BRUSHLESS MOTOR

Masami Nagata; Sumio Yanase, both of Okazaki, and Yousuke Setaka, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

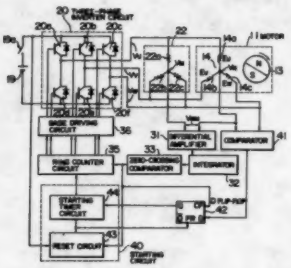
Filed Sep. 27, 1985, Ser. No. 780,970
Claims priority, application Japan, Oct. 4, 1984, 59-209445; Feb. 14, 1985, 60-28063
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **8 Claims**

1. A control apparatus for a brushless motor which has a stator provided with an armature winding having armature coils connected in three-phase star-connection, and a rotor comprising a permanent magnet having at least two poles, which rotor is driven by switching over an exciting current supplied to said armature coils, comprising:

a resistance circuit having a plurality of resistors connected in star-connection so that each of the resistors is in parallel with a corresponding one of the armature coils of said armature winding;

signal generating means for generating an excitation switchover signal to switch over and control the exciting current supplied to the armature coils of said armature winding in accordance with variations in a potential difference between a neutral point of said armature winding and a neutral point of said resistance circuit;

an inverter circuit for switching over and controlling the exciting current supplied to the armature coils of said armature winding in accordance with the excitation switchover signal from said signal generating means; and



detecting means for detecting a stable position where said rotor stops and a direction of revolution and oscillation of said rotor and generating a detection signal indicative thereof when the exciting current is caused to flow through the armature coils for two phases at the start of said brushless motor, in response to a counter electromotive force generated in the armature coil for the other one phase due to the revolution and oscillation of said rotor while the exciting current flows through the armature coils for the two phases, and for supplying a starting signal to said inverter circuit in accordance with the detection signal.

4,641,067

MOTOR CONTROL METHOD AND APPARATUS THEREFOR

Ryuji Iizawa, and Koji Murakami, both of Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Sep. 11, 1985, Ser. No. 774,843

Claims priority, application Japan, Sep. 13, 1984, 59-192210; Sep. 13, 1984, 59-192208; Sep. 13, 1984, 59-192209; Sep. 26, 1984, 59-201001

Int. Cl.[4] H02P *1/22*

U.S. Cl. 318—287 **5 Claims**

1. The method of controlling operation of an electric motor to change an operating condition of said motor upon the occurrence of an abnormal load condition comprising the steps of:

(a) initiating a timing means during periods of operation of said motor to establish a series of predetermined time periods ΔT;

(b) measuring current I applied to said motor during said periods of operation as a measure of load condition thereof;

(c) deriving an initial value Imin representative of load current at the beginning of each said time period ΔT;

(d) Adding a predetermined value ΔX to said value Imin to set a reference value Ir representative of said abnormal load condition;

(e) periodically measuring sucessive values of I at successive time intervals substantially shorter than time period ΔT;

(f) comparing said sucessive measured values of I with Ir and with said value Imin;

(g) if within a time period ΔT the value of I should decrease below said value Imin and then begin to increase, resetting said timing means to begin a new time period ΔT and setting a new reference value Ir; and

(h) if within a time period ΔT the measure value I should increase to equal or exceed the value Ir, recognizing such increase as said abnormal load condition and initiating a change in operating condition of said motor in response thereto.

2. A motor control apparatus comprising:

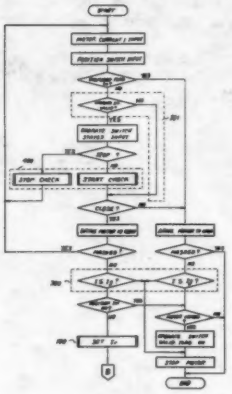
an electric motor connectable to an electric power supply circuit to be driven thereby;

a manual switch for connecting said motor to said power supply circuit to drive said motor;

means for measuring a value I of current applied to said motor as a measure of load on said motor;

first clock means arranged to repeatedly measure a predetermined time period ΔT;

means responsive to said first clock means for adding a predetermined value ΔX to a value Imin measured at the beginning of each time period ΔT to set a reference value Ir;



means for storing said reference value Ir and said value Imin used to set said reference value Ir;

second clock means arranged to repeatedly generate signals to establish successive time intervals substantially shorter than time period ΔT;

first comparing means initiated by said second clock means signals for comparing measured values I at each said time interval with said stored value Imin and for detecting a condition when said measured values I begin to rise from a value equal to or less than said stored value Imin;

means responsive to detection of said condition for resetting said first clock means to begin a new time period ΔT and for resetting a new reference value Ir; and

second comparing means initiated by said second clock means signals for comparing said measured values I at each said time interval with said stored reference value Ir to detect when said measured value I equals or exceeds said reference value Ir, and for actuating a control of said motor in response to said detection.

4,641,068

DC MOTOR DRIVING DEVICE

Manabu Sawaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,790

Claims priority, application Japan, Aug. 15, 1984, 59-170259

Int. Cl.[4] H02P *7/00*

U.S. Cl. 318—317 **5 Claims**

1. A DC motor driving device comprising:

a motor driving transistor having an emitter connected to a

first terminal of a DC motor whose rotational speed is voltage-controllable;

voltage supplying means for applying a supply voltage between a collector of said transistor and a second terminal of said DC motor, a potential at said second terminal of said DC motor being employed as a reference potential;

bias supplying means for supplying a bias current to a base of said transistor;

voltage generating source means for generating a fixed reference voltage, with respect to said reference potential, for voltage-controlling said rotational speed, and

diode means for passing current between said base and said voltage generating source means to reduce the effect of the base-emitter voltage of said driving transistor on the voltage applied to said motor.

3. A DC motor driving device comprising:

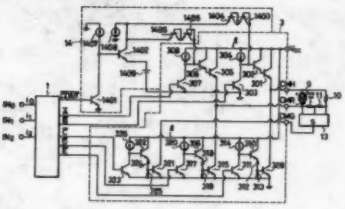
a motor driving transistor having an emitter connected to a first terminal of a DC motor;

voltage supplying means for applying a supply voltage between a collector of said transistor and a second terminal of said DC motor, a potential at said second terminal of said DC motor being employed as a reference potential;

bias supplying means for supplying a bias current to a base of said transistor;

a voltage generating source for generating a fixed reference voltage with respect to said reference potential; and

diode means provided to pass current between said base and said voltage generating source;



wherein said driving transistor comprises a Darlington-connected transistor pair, and wherein said diode means comprises first and second transistors each having a base and a collector connected together, said first and second transistors being connected in series with one another.

4. A DC motor driving device comprising:

a motor driving transistor having an emitter connected to a first terminal of a DC motor;

voltage supplying means for applying a supply voltage between a collector of said transistor and a second terminal of said DC motor, a potential at said second terminal of said DC motor being employed as a reference potential;

bias supplying means for supplying a bias current to a base of said transistor;

a voltage generating source for generating a fixed reference voltage with respect to said reference potential; and

diode means provided to pass current between said base and said voltage generating source;

wherein said voltage generating source comprises a fixed voltage source having a first terminal connected to said second terminal of said DC motor, a reference transistor having an emitter connected to a second terminal of said fixed voltage source, a first current source connected in series with a collector of said reference transistor, and a second current source connected to a base of said reference transistor.

4,641,069

PLURAL MOTOR CHANGEOVER CONTROL SYSTEM

Yoshiki Fujioka, Yamato, and Mitsuhiko Hirota, Tokyo, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

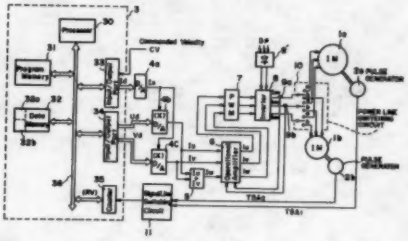
PCT No. PCT/JP83/00408, § 371 Date Jul. 10, 1984, § 102(e) Date Jul. 10, 1984, PCT Pub. No. WO84/02040, PCT Pub. Date May 24, 1984

PCT Filed Nov. 11, 1983, Ser. No. 631,559

Claims priority, application Japan, Nov. 13, 1982, 57-199233

Int. Cl.⁴ G05B *11/32*

U.S. Cl. 318—625 **9 Claims**



1. A plural motor changeover control system for a plurality of motors, each having different power output characteristics and in which switching among the motors occurs, said system comprising:

identical sensors connected to said motors;

a single servo control circuit for controlling the motors; and

velocity error-amplitude command means, having conversion tables each corresponding to one of said motors and operatively connected to said single servo control circuit, for selecting the one of the conversion tables corresponding to the motor designated for operation from among said plurality of motors, for fetching an amplitude command, from said selected conversion table, corresponding to a velocity error which is a difference between an actual velocity of said designated motor and a commanded velocity, and for applying the amplitude command to said servo control circuit to control the designated motor each conversion table compensating for the output produced by the corresponding sensor.

4,641,070

DEVICE FOR DETERMINING AND ADJUSTING THE POSITION OF A WEB

Wolfgang Pfizenmaier, Neckargemünd; Heinrich Heidt, Neckarsteinach, and Rolf P. Lehner, Kirchheim/Teck, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed May 19, 1983, Ser. No. 496,220

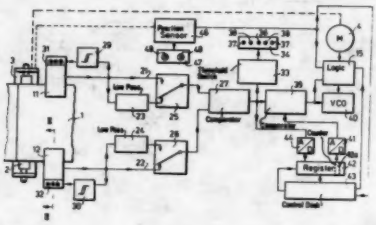
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218866

Int. Cl.⁴ G05B *1/06*; G01N *21/86*; G01V *9/04*

U.S. Cl. 318—640 **4 Claims**

1. Device for determining and adjusting the position of a web, the device having two sensor units each with a respective light source element directed towards the web and a respective photoelectric sensor element responsive to reflected light, a control unit responsive to respective output signals of the two sensor units, and a device connected to the control unit and fed by an adjusting signal from the control unit for adjusting the position of the web, comprising reflectors disposed at a side of the web facing away from the sensor units and projecting beyond respective opposite edges of the web, one of the two elements of one of the sensor units being directed towards one of said opposite edges of the web and the other of the two elements of said one of the sensor units being directed to a reference surface, one of the two elements of the other sensor unit being directed towards the other of said opposite edges of

the web and the other of the two elements of said other sensor unit being also directed to a reference surface, the adjusting signal fed from the control unit to the adjusting device being a function of the difference of the two output signals of the two sensor units, at least one of the two sensor units being coupled via a low-pass filter to the control unit means for feeding a control signal to the control unit for addition to the output signal of one of the sensor units, means for feeding the output signals of the two sensor units to a first comparator having an output signal, means for feeding said output signal of said first comparator and said control signal to the second comparator



having an output delivering a adjusting signal, and means for adding said control signal to the output signal of one of the sensor units as said second comparator responds to said control signal and the output signal of the first comparator, and the device having means for converting from manual to automatic operating mode, including means for storing, at the instant of conversion to the automatic operating mode, said output signal of said first comparator generated during the manual operating mode, and means for feeding said stored output signal of said first comparator to said second comparator as a control signal during the automatic operating mode.

4,641,071

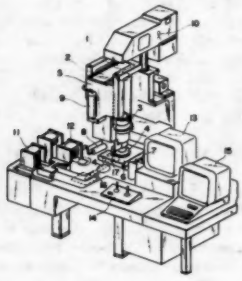
SYSTEM FOR CONTROLLING DRIVE OF A WAFER STAGE

Shigemoto Tazawa, Yokohama, and Naoki Ayata, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1985, Ser. No. 780,034

Int. Cl.[4] **G05B** *1/06*

U.S. Cl. 318—640 **38 Claims**



1. A system for controlling a drive of a movable member for carrying a workpiece, said system comprising:

first servo control means for moving the workpiece carrying member at a relatively high speed and for stopping the workpiece carrying member with a relatively low positional accuracy relative to a target position;

second servo control means for moving the workpiece carrying member at a relatively low speed and for stopping the workpiece carrying member with a relatively high positional accuracy relative to the target position; and

means for selecting one of or a combination of said first and second servo control means in accordance with the positional accuracy required of the workpiece carrying member with respect to the target position;

wherein said first servo control means includes means for setting the desired moving speed of the workpiece carrying member in accordance with a speed pattern that is substantially trapezoidal in shape, and wherein said first servo control means further includes means for controlling the moving speed of the workpiece carrying member in accordance with the speed pattern set by said setting means.

4,641,072

ELECTRO-MECHANICAL ACTUATOR

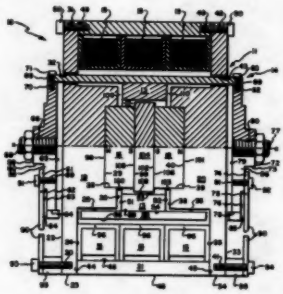
Richard D. Cummins, Orchard Park, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Continuation-in-part of Ser. No. 537,109, Sep. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 321,340, Nov. 6, 1981, abandoned. This application Jul. 17, 1985, Ser. No. 756,079

Claims priority, application United Kingdom, Nov. 4, 1982, 8231509; Fed. Rep. of Germany, Nov. 9, 1982, 3241254; France, Nov. 16, 1982, 82 19146

Int. Cl.[4] **G05B** *11/00;* **H02K** *41/02*

U.S. Cl. 318—687 **9 Claims**



1. An electro-mechanical actuator, comprising:

a body formed of a magnetically-permeable material and having an annular chamber therewithin, said body having an outer portion arranged radially outwardly of said chamber and having an inner portion arranged radially inwardly of said chamber, said body having an opening therethrough which communicates with said chamber, said body having first and second surfaces arranged in spaced facing relation to one another;

an annular armature having one magnetic portion arranged within said chamber and having another non-magnetic portion penetrating said body opening, said armature having a first surface arranged to face said body first surface and having a second surface arranged to face said body second surface, any space between said body first surface and said armature first surface defining a first air gap and any space between said body second surface and said armature second surface defining a second air gap;

suspension means arranged between said body and armature for mounting said armature for movement between said first and second body surfaces;

a coil mounted on said body and selectively operable to create a magnetic field in at least one flux path which passes through said first and second air gaps; and

at least one permanent magnet mounted on said body, each magnet being operatively arranged to create through said

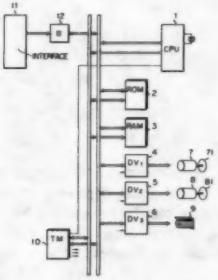
body and armature a first magnetic loop passing through one of said air gaps but not the other of said air gaps and a second magnetic loop passing through said other air gap but not said one air gap.

4,641,073

STEPPER MOTOR CONTROL SYSTEM

Kenji Sawada, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 3, 1983, Ser. No. 564,714
Claims priority, application Japan, Dec. 24, 1982, 57-234701
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **29 Claims**



1. A stepper motor control system for rotating a stepper motor by a desired amount of angular displacement, comprising:

a stepper motor, having a rotatable member, for rotating the rotatable member at a rotation speed; and

control means, operatively connected to said stepper motor, for driving said stepper motor through the desired amount of angular displacement when the desired amount of angular displacement is larger than a predetermined amount by accelerating the rotatable member of said stepper motor by supplying an acceleration pulse sequence to said stepper motor until the rotation speed equals a predetermined rotation speed, driving the rotatable member at substantially the predetermined rotation speed, and sequentially decelerating the rotatable member of said stepper motor from the predetermined rotation speed by supplying a decelerating pulse sequence to said stepper motor to stop after the desired amount of angular displacement, and for driving said stepper motor when the desired amount of angular displacement is smaller than the predetermined amount of angular displacement by accelerating the rotatable member of said stepper motor by supplying the acceleration pulse sequence to said stepper motor until the rotation speed equals an intermediate rotation speed slower than the predetermined rotation speed determined according to the desired amount of angular displacement, regulating the rotation speed when the accelerating is stopped so that said stepper motor is able to follow decelerating control, and decelerating the rotatable member of said stepper motor by supplying a portion of the deceleration pulse sequence to said stepper motor after the regulating.

4,641,074

SYNCHRONOUS MOTOR PROTECTION

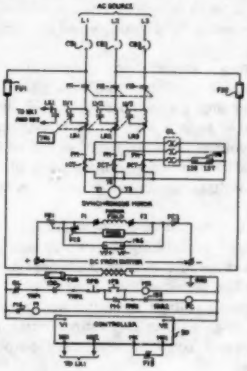
James W. Hamilton, Jr., Mebane, and Edward A. Long, Chapel Hill, both of N.C., assignors to General Electric Co., Charlottesville, Va.

Filed Sep. 21, 1984, Ser. No. 652,983
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—706 **15 Claims**

1. A method of reduced voltage starting protection of synchronous type motors having ac energized stator winding means, and amortisseur winding means that are subject to thermal damage upon energization of the motor for excessive time intervals at operation below synchronous motor speeds, comprising the steps of:

(a) deriving a first electrical signal indicative of a comparison of the actual accrued motor running time and of the allowable motor running time at any instantaneous actual percentage of synchronous motor speed;

(b) removing ac energization from the motor responsive to the electrical signal being indicative of actual accrued motor running time exceeding allowable motor running time at any instantaneous actual percentage of synchronous motor speed;



(c) providing ac energization to the motor for a first start time period at a reduced voltage magnitude that is less than the full rated voltage;

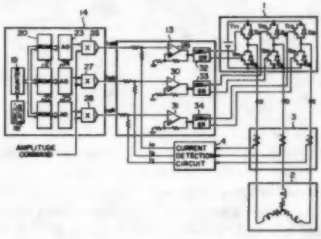
(d) modifying the first electrical signal responsive to ac energization being provided at a reduced voltage magnitude to extend the maximum allowable running time at any instantaneous actual percentage of synchronous speed with respect to the actual running time permitted with ac energization at full rated voltage so that inadvertent removal of ac energization is minimized.

4,641,075

METHOD OF AND APPARATUS FOR CONTROLLING CURRENT OF INVERTER

Katsuhiro Asano, Toyoake; Yukio Inaguma, Nagoya, and Norio Iwama, Ama, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 8, 1984, Ser. No. 608,247
Claims priority, application Japan, May 19, 1983, 58-087962
Int. Cl.[4] H02P *5/40*
U.S. Cl. 318—811 **18 Claims**



1. A method of controlling current of an inverter having a

plurality of switching elements which are selectively connected to an anode and a cathode of a DC power source through an ON/OFF control in which output currents of the inverter connected to a three-phase load are detected, and control is effected so that instantaneous values of the output currents are substantially equal to set output current command values, respectively, comprising the steps of:

(a) providing a phase voltage defined as an ideal phase voltage between an input terminal of each phase load of the three-phase load and a neutral point wherein each ideal phase voltage is represented by a phase voltage obtained when currents of predetermined output wave commands are allowed to flow through said three-phase load, respectively;

(b) selecting a specific ideal phase voltage having a maximum absolute value of said ideal phase voltages;

(c) maintaining a specific one of said switching elements associated with a load phase having said specific ideal phase voltage in either one of an ON or OFF state during a period of time when a phase angle of said specific ideal phase voltage is within a predetermined phase angle range;

(d) detecting output currents of said inverter; and

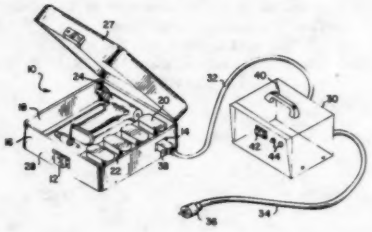
(e) ON/OFF controlling the two switching elements other than said specific switching element a plurality of times during the period of said time when the phase angle of ideal phase voltage is within said predetermined phase angle range so that said output current waveforms are substantially equal to respective output current wave commands.

4,641,076

METHOD AND APPARATUS FOR STERILIZING AND CHARGING BATTERIES

Harry A. Linden, Santa Barbara, Calif., assignor to Hall Surgical-Division of Zimmer, Inc., Carpinteria, Calif.

Filed Jan. 23, 1985, Ser. No. 693,881
Int. Cl.⁴ H02J 7/00
U.S. Cl. 320—2 **10 Claims**



3. Apparatus for providing at least one sterile, charged battery for use in a sterile field comprising:

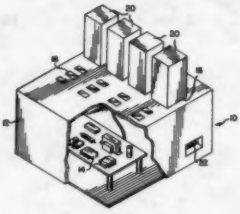
a container adapted to permit the entrance of a sterilant and to prevent the entrance of contaminants, said container being adapted to house said battery during sterilization and storage, and said container having means for charging said battery therein while maintaining said battery in a sterile state.

4,641,077

METHOD AND APPARATUS FOR PROVIDING STERILE CHARGED BATTERIES

John H. Pascaloff, Goleta, Calif., assignor to Hall Surgical-Division of Zimmer, Inc., Carpinteria, Calif.

Filed Jan. 23, 1985, Ser. No. 693,882
Int. Cl.⁴ H02J 7/00
U.S. Cl. 320—2 **2 Claims**



1. A method of providing sterile, charged batteries for use in a sterile field comprising the steps of:

sterilizing at least one battery and a battery charger, said battery and battery charger being adapted to withstand exposure to the environment present during such sterilizing step;

transferring said battery and said battery charger in a sterile state to said sterile field; and

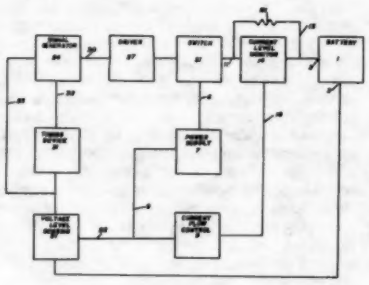
charging said battery to a desired voltage with said battery charger in said sterile field.

4,641,078

METHOD FOR CHARGING ELECTRICAL STORAGE BATTERIES

Jimmie N. Short, Lexington, Ky., assignor to Ralph J. Stolle Company, Cincinnati, Ohio

Filed Nov. 13, 1984, Ser. No. 639,090
Int. Cl.⁴ H02J 7/00
U.S. Cl. 320—21 **9 Claims**



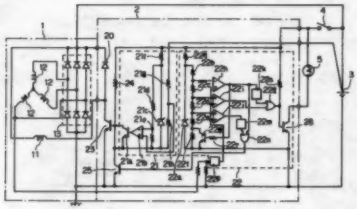
5. Apparatus for charging electrical storage battery means including direct current source means to provide said generally linear charging current; current controller means providing a central signal determine the rate of flow of current to said storage battery; switch means connected in series between said direct current source means and said battery means and having signal input means to receive said control signal whereby said switch means is operated by said controller in response to said current flow rate to said battery to regulate rate of current flow to said battery modulator means to receive said control signal and supply an operating signal to cyclical wave generating means to selectively periodically interrupt said cyclical wave generating means.

4,641,079

BATTERY VOLTAGE REGULATING SYSTEM

Hidetoshi Kato, Suzuka; Fuyuky Maehara, Kariya, and Nobuo Mayumi, Oubu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 15, 1985, Ser. No. 702,380
Claims priority, application Japan, Feb. 20, 1984, 59-31209
Int. Cl.[4] H02J 7/14, 7/24; H02P 9/26, 9/30
U.S. Cl. 320—64 13 Claims



7. A system for regulating a voltage on a battery, using generator means for producing a generation voltage at an output terminal thereof, comprising:

first control means for comparing said battery voltage with a first reference, and for selectively enabling said generator means based on such comparing;

means for producing a second reference which is alterable between a first value and a second value;

second control means for comparing said generation voltage with said second reference, and for

(1) when said generation voltage is greater than said first value of said second reference:

(a) altering said second reference to said second value, and

(b) disabling said first control means and selectively enabling and disabling said generator to maintain said battery voltage within a predetermined range of said second reference to prevent overcharging; and

(2) when said generation voltage is lower than said second value of said second reference:

(a) altering said second reference to said first value, and

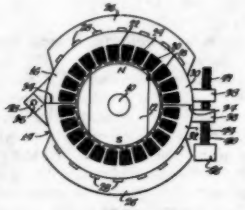
(b) enabling said generator to keep said battery voltage from falling too low.

4,641,080

PERMANENT MAGNET GENERATOR WITH FAULT DETECTION

Timothy F. Glennon; Raymond N. Olson, and Donald A. Straznickas, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 18, 1984, Ser. No. 663,083
Int. Cl.[4] H02P 9/40
U.S. Cl. 322—49 8 Claims



1. In a generating system including a permanent magnet generator, the combination of:

a rotor carrying at least one permanent magnet;

a stator in proximity to said rotor and normally separated therefrom by a small air gap;

at least one electrical winding magnetically associated with said stator and in which current may be induced by a magnetic field generated by said permanent magnet;

means mounting said stator and said winding for movement toward and away from said rotor;

means for moving said stator and said winding away from said rotor;

means for detecting the development of a fault in said winding; and

means responsive to said detecting means for operating said moving means;

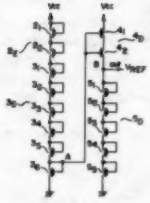
whereby upon detection of the development of a fault in said winding, said winding and said stator will be moved away from said rotor to reduce the magneto motive force available to induce current in said winding to thereby reduce the current induced in said winding to prevent destruction of said permanent magnet generator.

4,641,081

SEMICONDUCTOR CIRCUIT OF MOS TRANSISTORS FOR GENERATION OF REFERENCE VOLTAGE

Ryoichi Sato, Kashiwa, and Toshio Mimoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1985, Ser. No. 706,529
Claims priority, application Japan, Feb. 28, 1984, 59-39146
Int. Cl.[4] G05F 3/16
U.S. Cl. 323—313 8 Claims



1. A circuit for producing a constant reference voltage, the reference voltage value being unaffected by variations in a related power source voltage, the circuit comprising:

a first set of enhancement type MOS transistors, the number of enhancement type MOS transistors being n, each one of said n transistors having a gate connected to a first active electrode, said n enhancement type MOS transistors being connected in series and having a first active electrode of a first one of said n enhancement type MOS transistors connected to the power source;

a first set of depletion type MOS transistors, the number of depletion type MOS transistors being m, each of said m transistors having a gate connected to a first active electrode, said m depletion type MOS transistors being connected in series, a first active electrode of a first one of said m transistors being connected to a second active electrode of the nth transistor of the series connection of said first set of enhancement type MOS transistors and a second active electrode of an mth transistor being connected to ground;

a second set of depletion type MOS transistors, the number of depletion type MOS transistors being x, gate electrodes of each of said x depletion type transistors being connected to a gate electrode of the mth transistor of the series connection of said first set of depletion type MOS transistors, said x transistors being connected in series and having a first active electrode of a first one of said x transistors being connected to the power source; and

a resistance component connected between a second active electrode of the xth transistor of the series connection of

said second set of depletion transistors and ground, wherein the constant reference voltage is a voltage appearing across said resistance component.

4,641,082

SIX-PORT REFLECTOMETER

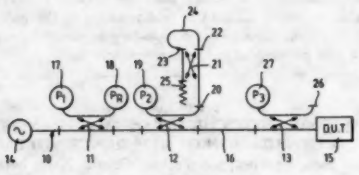
Eric J. Griffin, Malvern; Richard J. Collier, Canterbury, and George Hjipieris, Stevenage, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 25, 1985, Ser. No. 727,227

Claims priority, application United Kingdom, May 24, 1984, 8413339

Int. Cl.[4] G01R 27/06

U.S. Cl. 324—58 B **5 Claims**



1. A six-port reflectometer including first, second and third directional couplers arranged to provide a series path for transmission of input radiation from a source to a load, and wherein:

(a) the first coupler is connected to first and second detectors;

(b) the second coupler is connected to the third directional coupler via a first waveguide and is also connected to a third detector and a fourth directional coupler;

(c) the fourth coupler has two ports connected together by a second waveguide and a further port connected to an absorber; and

(d) the third coupler is connected to a reflector and to a fourth detector.

4,641,083

METHOD AND APPARATUS FOR SUPERVISING CHARGES IN BLAST FURNACE USING ELECTROMAGNETIC WAVES

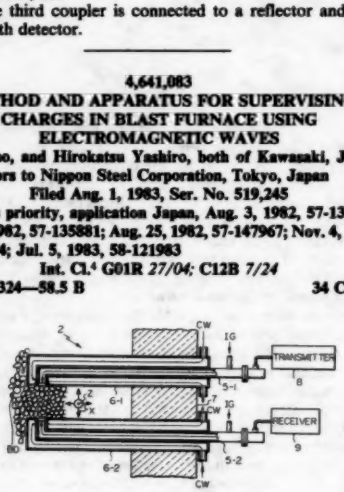
Jiro Ohno, and Hirokatsu Yashiro, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,245

Claims priority, application Japan, Aug. 3, 1982, 57-135354; Aug. 4, 1982, 57-135881; Aug. 25, 1982, 57-147967; Nov. 4, 1982, 57-193864; Jul. 5, 1983, 58-121983

Int. Cl.[4] G01R 27/04; C12B 7/24

U.S. Cl. 324—58.5 B **34 Claims**



1. A method for supervising charges in a blast furnace, comprising the steps of;

radiating microwave radiation into said charges composed of alternating layers of at least ore and coke the wavelength of which radiation is substantially the same as the particle size of each charge;

receiving and detecting the microwave radiation which is reflected or scattered by the charge or transmitted through the charge; and

analyzing the detected microwave radiation so as to distinguish ore and coke based on the reflection or scattering of the microwave radiation by the ore and the transmission of the microwave radiation through the coke.

4,641,084

ION CONCENTRATION MEASURING APPARATUS

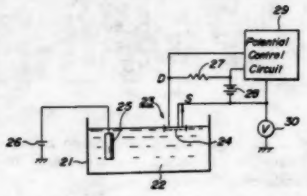
Satsuki Komatsu, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,865

Claims priority, application Japan, Dec. 15, 1983, 58-235134

Int. Cl.[4] G01N 27/02, 27/26

U.S. Cl. 324—71.5 **8 Claims**



1. An ion concentration measuring apparatus comprising:

a container for holding a test liquid containing at least one kind of ion whose concentration is to be measured;

means in contact with the test liquid for maintaining the test liquid at a constant potential;

at least one ion sensitive field effect transistor having a gate portion which is selectively sensitive to said ion, drain and source;

at least one measuring circuit comprising a constant voltage supply source which is not connected to the earth and which applies a constant voltage across the drain and source of the ion sensitive field effect transistor, a reference resistor connected to the constant voltage supply source and the drain or source, a potential control circuit having inputs connected across the reference resistor and an output connected to the drain or source for controlling a potential at the drain or source in such a manner that a voltage across the reference resistor remains a predetermined value, and a voltmeter for measuring a variation of the potential at the drain or source as a measure of the concentration of ion.

4,641,085

VECTOR NETWORK ANALYZER WITH INTEGRAL PROCESSOR

S. Bruce Donecker, Sebastopol; Ronald D. Stewart, and Wayne L. Frederick, both of Santa Rosa, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 9, 1984, Ser. No. 569,111

Int. Cl.[4] G01R 23/16

U.S. Cl. 324—77 R **15 Claims**

1. A signal separation circuit for a radio frequency (RF) vector network analyzer, comprising

an RF input port for receiving an RF signal;

a reversing switch coupled to the RF input port;

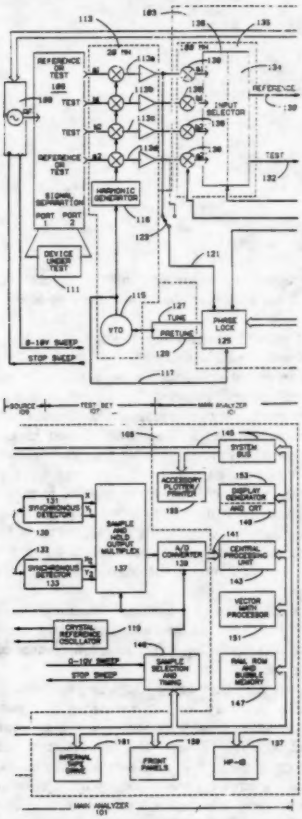
first and second test ports coupled to the reversing switch for reversibly routing the RF signal to a device under test;

first sampling means coupled to the first test port for deriving a first RF sample signal from an RF signal incident on the first test port from the device under test;

second sampling means coupled to the second test port for deriving a second RF sample signal from an RF signal incident on the second test port from the device under test;

a first reference path coupled to the RF signal between the reversing switch and the first test port for providing a first reference signal;

a second reference path coupled to the RF signal between the reversing switch and the second test port for providing a second RF reference signal; and



a frequency converter for converting respectively the first and second RF reference signals and the first and second RF sample signals respectively to first and second intermediate frequency (IF) reference signals and first and second IF sample signals.

4,641,086

VECTOR NETWORK ANALYZER WITH INTEGRAL PROCESSOR

John T. Barr, IV; Michael J. Neering; Douglas E. Fullmer; Roger P. Oblad, all of Santa Rosa; Wayne C. Cannon, Forestville, and Glenn E. Elmore, Santa Rosa, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 9, 1984, Ser. No. 568,990

Int. Cl.[4] G01R *23/16*

U.S. Cl. 324—77 R **4 Claims**

1. An RF network analyzer system for analyzing a device under test (DUT), comprising:

an RF signal source having

an RF signal output;

first control means for controlling operation of the RF signal source, said first control means including means for controlling the frequency changes and retrace of the RF signal output of the RF signal source, and

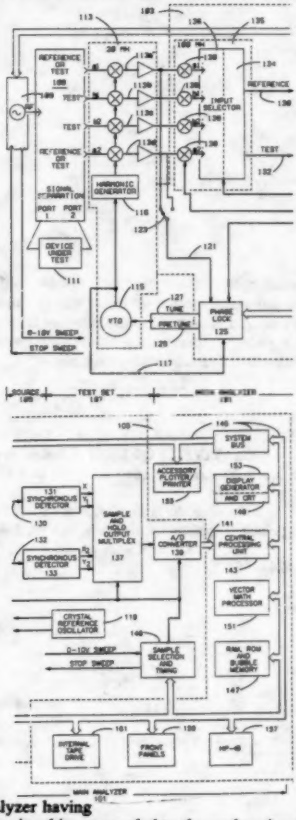
first handshake means coupled to the first control means for communicating with the RF signal source;

a test set coupled to the RF signal source and the DUT, said test set having

an analog signal output,

second control means for controlling operation of the test set, and

second handshake means coupled to the second control means for communicating with the test set; and



a main analyzer having

an analog signal input coupled to the analog signal output of the test set,

an analog to digital converter for digitizing the analog signal input, said analog to digital converter having a digitized output signal,

third handshake means coupled to the first and second handshake means, and

a processor coupled to the third handshake means and the analog to digital converter for selecting the frequency changes of the RF signal source, and for processing the digitized measurement output signal during the frequency changes and retrace of the RF signal output.

4,641,087

PHASE COMPARATOR APPARATUS AND METHOD

Frederick E. Coffield, Livermore, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 1, 1985, Ser. No. 697,296

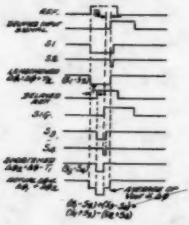
Int. Cl.[4] G01R *25/00*

U.S. Cl. 324—83 R **21 Claims**

1. A phase comparator for measuring the relative phase difference between first and second electrical signals, said phase comparator comprising:

a first channel phase comparator means for producing a lengthened phase difference output representing a greater than actual phase difference between said first and second signal;

a second channel phase comparator means for producing a shortened phase difference output representing a less than actual phase difference between said first and second signals; and



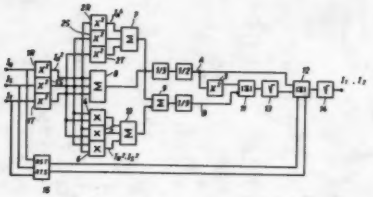
combining means connected to receive said lengthened phase difference output and said shortened phase difference output and to produce an average thereof as a composite output representing the actual phase difference between said first and second signals.

4,641,088

ROOT MEAN SQUARE MEASURING DEVICE FOR NEGATIVE SEQUENCE CURRENT

Curt Jacobson, Västerås, Sweden, assignor to Asea Aktiebolag, Västerås, Sweden

Filed Feb. 6, 1985, Ser. No. 698,822
Claims priority, application Sweden, Feb. 7, 1984, 8400621
Int. Cl.[4] G01N *25/00*
U.S. Cl. 324—86 **9 Claims**



1. A method for determining at least one of the positive sequence current I_1 and the negative sequence current I_2 in a three-phase electrical network under unbalanced load conditions, comprising:

measuring each phase current I_R, I_S and I_T and the phase sequence RST and RTS;

calculating the I_1 and I_2 in accordance with the following formula:

$$I_1, I_2 = \sqrt{|A \pm \sqrt{|A^2 - B|}\ |}$$

wherein $A = I_R^2 + I_S^2 + I_T^2/6$ and

$$B = \frac{I_R^4 + I_S^4 - I_T^4 - I_R^2 I_S^2 - I_R^2 I_T^2 - I_S^2 I_T^2}{9}$$

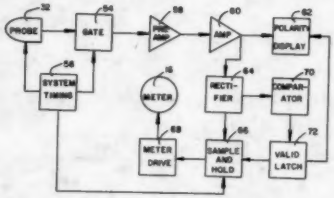
and for the phase sequence RST, I_1 and I_2 are respectively + and −, and for the phase sequence RTS, I_1 and I_2 are respectively − and +.

4,641,089

AMMETER APPARATUS AND METHOD FOR CAPTURING CURRENT READINGS

Bruce W. Pearman, Colorado Springs, Colo., and Hal A. Huggins, 106 E. Cheyenne Rd., Colorado Springs, Colo. 80906, assignors to Hal A. Huggins, Colorado Springs, Colo.

Filed Apr. 27, 1983, Ser. No. 489,062
Int. Cl.[4] G01R *19/04*
U.S. Cl. 324—103 P **27 Claims**



1. Apparatus for measuring a maximum electrical current occurring from a current source during a selected interval of time comprising:

first and second electric inputs adapted to be electrically connected to said source;

conversion means connected to said inputs for receiving an electrical current therefrom and producing a signed voltage proportional to the magnitude of said current;

gate means between at least one of said inputs and said conversion means for passing said current when closed and prohibiting passage of said current when open;

first display means electrically connected to said conversion means for indicating the polarity of said voltage;

rectifying circuitry electrically connected to said conversion means and operative to produce a voltage magnitude signal proportional to the absolute value of the signed voltage;

capture circuitry having a charge-retaining element receiving said voltage magnitude signal and maintaining a charge corresponding to the maximum value of said voltage magnitude signal;

reset means for discharging said charge-retaining element;

first timing circuitry for closing said gate means during a first interval of time, for opening said gate means during a second interval of time and for resetting said capture circuitry at the end of said second interval of time, said first timing circuitry means incorporating said reset means and including means for varying the duration of said second interval of time;

display circuitry means responsive to the charge on said charge-retaining element for generating an output signal having a magnitude proportional to said charge;

second display means for receiving said output signal and displaying the magnitude of said output signal; and

power supply means associated with said conversion means and said display circuit means.

4,641,090

POLYPHASE ELECTRICAL SIGNAL MEASURING APPARATUS

Philip Danby, Chestnut Hill, Mass., assignor to Refac Electronics Corporation, Winsted, Conn.

Filed Oct. 22, 1984, Ser. No. 663,222
Int. Cl.[4] G01R *19/00, 1/38, 29/00*
U.S. Cl. 324—107 **11 Claims**

1. Apparatus for simulataneously measuring a magnitude and displaying a numerical representation of the measured magnitude for a voltage, current and frequency in a polyphase alternating current system, said apparatus comprising:

means for coupling said polyphase alternating current system to said apparatus;

means for selectively conditioning said apparatus to operate in either a line-to-line or a line-to-neutral measuring mode;

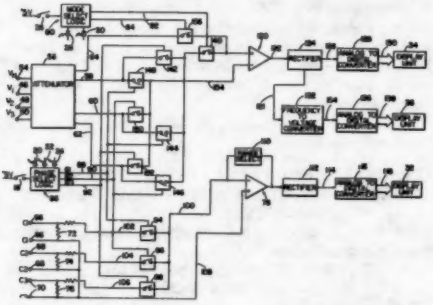
means for selectively choosing for measurement any one phase of said polyphase system coupled to said apparatus;

first display means for indication a magnitude of a measured voltage associated with a selected phase;

second display means for indicating a magnitude of a measured current associated with a selected phase;

third display means for indicating a measured frequency associated with a selected phase;

first circuit means for sensing a voltage associated with a selected phase wherein said voltage is sensed line-to-line or line-to-neutral in accordance with said selected measuring mode, said first circuit means including first other circuit means for transforming said sensed voltage into a



digital signal representative of the voltage magnitude of said sensed voltage to drive said first display means;

second circuit means for sensing a current associated with a selected phase wherein said current is sensed line-to-line or line-to-neutral in accordance with said selected measuring mode, said second circuit meand including second other cirucit means for transforming said sensed current into a digital signal representative of the current magnitude of said sensed current to drive said second display means, and

third circuit means for sensing a frequency associated with a selected phase, said third circuit means including other circuit means for transforming said sensed frequency signal into a digital signal representative of said sensed frequency signal to drive said third display means.

4,641,091

DEVICE FOR TESTING AND CALIBRATING TREASURE HUNTING METAL DETECTORS

Ivan H. Cone, 845 Palmer Blvd., Fortuna, Calif. 95540

Filed Sep. 17, 1984, Ser. No. 650,699

Int. Cl.[4] G01R *35/00;* **G01V** *13/00*

U.S. Cl. 324—202 **6 Claims**

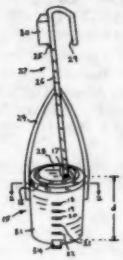
1. A device for testing and calibrating a treasure hunting metal detector, comprising:

an enclosure;

a quantity of material of composition of the background material to be encountered in the search environment of said treasure hunting metal detector, said material being contained within said enclosure;

a plurality of cross members, each of said plurality of cross members extending from a side of said enclosure into said enclosure, each of said plurality of cross members forming an open slot within the interior region of said enclosure and being surrounded by said quantity of material; and

a plurality of slide members adapted to slide within said slots formed within said plurality of cross members, each of



said slide members having a means of carrying a simulated metal treasure.

4,641,092

ROTARY PROBE APPARATUS FOR DETECTING FLAWS IN A TEST OBJECT

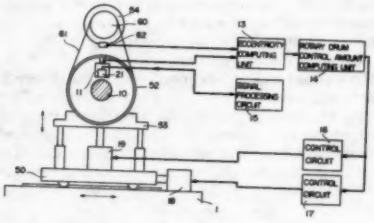
Takahide Sakamoto; Tatsuo Hiroshima, both of Hyogo; Noriyuki Matsubara, and Kenichi Miyata, both of Konomima-chi, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jul. 5, 1983, Ser. No. 510,972

Claims priority, application Japan, Jul. 8, 1982, 57-119421; Jul. 8, 1982, 57-119422

Int. Cl.[4] G01N *27/87;* **G01R** *33/12;* **G01B** *7/14*

U.S. Cl. 324—227 **20 Claims**



1. A flaw detection apparatus of rotary probe type which rotates a non contact probe at a spaced distance from the peripheral surface of a hot rolled object to be inspected that has a circular transverse cross-section, comprising:

a rotary member which supports and rotates said probe,

a guide tube for guiding said object to be inspected toward the center of said rotary member,

pinch rolls disposed before and after said rotary member,

relative position changing means for changing the relative position of said rotary member with respect to said object to be inspected,

distance detection means mounted on said rotary member for rotation therewith and continually operative to detect a distance between said probe and the peripheral surface of said object to be inspected and providing an output signal indicating said distance between said probe and said peripheral surface of said object, and

means responsive to said output signal for controlling said relative position changing means to maintain a substantially constant spacing between said probe and said peripheral surface thereby to control lift-off errors during a flaw detection operation caused by variances in the distance between said probe and said object to be inspected.

4,641,093

METHOD AND DEVICE FOR MAGNETIC TESTING OF MOVING ELONGATED FERROMAGNETIC TEST PIECE FOR MECHANICAL PROPERTIES BY UTILIZING THE MAGNITUDE OF REMANENT MAGNETIC FLUX AND A PULSED MAGNETIC FIELD

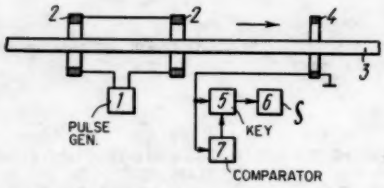
Mikhail A. Melgui, and Sergei G. Sandomirsky, both of Minsk, U.S.S.R., assignors to Institut Prikladnoi Fiziki Akademii Nauk Belorusskoi SSR, Minsk, U.S.S.R.

PCT No. PCT/SU81/00062, § 371 Date Mar. 22, 1983, § 102(e) Date Mar. 22, 1983, PCT Pub. No. WO83/00559, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 28, 1981, Ser. No. 476,879

Int. Cl.[4] G01N *27/72*; G01R *33/12*

U.S. Cl. 324—239 3 Claims



2. A device for magnetic testing of a moving elongated ferromagnetic test piece, comprising:

a magnetizing pulse generator;

magnetizing coils embracing the test piece and being located therealong, said magnetizing coils are connecting to the magnetizing pulse generator such that the magnetic fields produced by them on the common axis thereof are directed towards each other;

a transducer embracing the test piece adapted to convert a gradient of remanent induction to an electrical signal;

a measuring circuit connected to the transducer;

an indicator connected to the measuring circuit;

the measuring circuit includes:

a gating means and an integrator connected in series with said gating means, and a comparison circuit adapted to select an instant of time at which a signal at the output of the transducer assumes a zero value, said comparison circuit having its input connected to the transducer and its output electrically connected to a control input of the gating means.

4,641,094

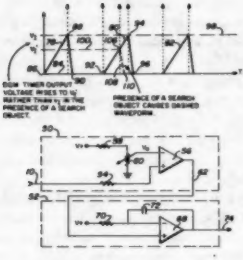
MAGNETOMETER CIRCUIT FOR MEASURING THE PERIOD OF BEAT FREQUENCY MAXIMA

Murphy L. Dalton, Jr., 6035 Aberdeen St., Dallas, Tex. 75230

Filed Apr. 16, 1984, Ser. No. 600,955

Int. Cl.[4] G01R *33/20*; G01V *3/14*

U.S. Cl. 324—302 6 Claims



1. A magnetometer circuit for use in a magnetic field detector having polarizable bodies in spaced apart relation, each body having a coil wound thereabout for receiving periodic polarizing current pulses, the coils connected to detector circuitry for producing a beat frequency signal having a response pulse following each of the current pulses, each response pulse having a maximum time width related to the difference in magnetic fields at the bodies, the circuit comprising:

means for threshold detecting said beat frequency signal pulses to produce a detected signal having a first state when said beat frequency signal pulse exceeds a selected threshold voltage and having a second state when said beat frequency signal pulse is less than said threshold voltage, and

means for producing respective output pulses for said first states of said detected signal, each said output pulse having an amplitude corresponding to the duration of the corresponding first state of said detected signal for producing constant amplitude output pulses to indicate a no-target background and for producing output pulses having a different amplitude from that of said constant amplitude to indicate detection of the target by said magnetometer circuit.

4,641,095

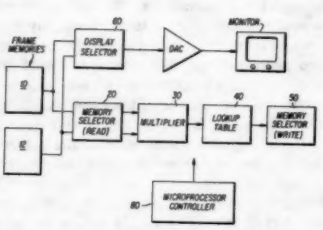
DETERMINATION OF T1 RELAXATION TIMES USED IN AUTOMATED NUCLEAR MAGNETIC RESONANCE IMAGE SYNTHESIS

Stephen J. Riederer, Durham, N.C., assignor to Duke University Medical Center, Durham, N.C.

Filed May 15, 1985, Ser. No. 734,101

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 8 Claims



1. A method for determining the spin-lattice relaxation time T1 of an image during a Nuclear Magnetic Resonance (NMR) measurement technique on a human body comprising the steps of:

subjecting said body to magnetic fields in accordance with a NMR technique using a multiple spin-echo pulse sequence at two different predetermined stored pulse repetition times TR1 and TR2;

measuring a first signal S(TR1) at a first one of (TR1) of said two repetition times including the steps of setting a longitudinal magnetization to an initial predetermined value M_0, waiting a first period of time equal to a first pulse repetition time TR1, and then flipping the longitudinal magnetization Mz by 90° into the x-y plane wherein the value of x-y plane magnetization immediately after the step of flipping is said first signal, called the transverse magnetization, which is equal to the value of the longitudinal magnetization immediately prior to the step of flipping and wherein said first signal S(TR1) is expressed by a first equation $S(TR1)=M_0[1-\exp(-TR1/T1)]$ where M_0 is a constant;

measuring a second signal at a second one TR2 of said two repetition times including the step of setting a longitudinal magnetization to an initial predetermined value M_0, waiting a second period of time equal to said second pulse repetition time TR2, and then flipping the longitudinal

magnetization by 90° into the x-y plane, wherein the value of the x-y plane magnetization immediately after the step of flipping is said second signal, called the transverse magnetization, which is equal to the value of the longitudinal magnetization immediately prior to the step of flipping and wherein said measured second signal S(TR2) is expressed by a second equation $S(TR2)=M_0[1-\exp(TR1/T1)]$;

storing the value of said measured first and second signals;

allowing said first and second measured signals to decay away at a characteristic time T2 and measuring said decaying signal at a plurality of echo times TE(i) i=1, . . . , N wherein said echo times are associated with 180° flips each associated with one of a multiple of spin-echos in said multiple spin-echo pulse sequence;

storing said measured decaying signal values at each of said echo times TE(i) for each of said first and second pulse repetition times TR1, TR2;

forming a first ratio R of said first to said second measured values;

solving a third equation $R=[1-\exp(TR1/T1)]/[1-\exp(-TR2/T1)]$ for an initial T1 value by using the stored values of said first ratio R and said pulse repetition times TR1 and TR2;

forming a plurality of secondary ratios $R_1 \ldots, R_N$ of said measured decaying signal values at each of said echo times TE(i) i=1 . . . , N for said first repetition time to said measured decaying signal values at each of said echo times TE(i) i=1 . . . , N for said second repetition time, respectively;

solving said third equation for a plurality of T1(i) i=1 . . . , N values using said plurality of secondary ratios $R_1 \ldots R_N$; and

finding the average value of at least said plurality of T1(i) i=1 . . . , N values.

4,641,096

NUCLEAR MAGNETIC RESONANCE SPECTROMETRY

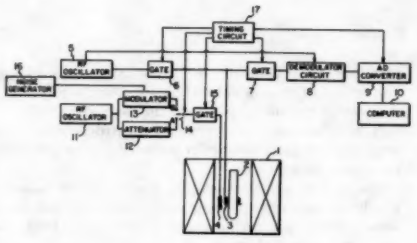
Osamu Kamo; Muneki Ohuchi, and Kazuhiro Matsushita, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,733

Claims priority, application Japan, Nov. 30, 1983, 58-226340

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—311 **5 Claims**



1. A nuclear magnetic spectrometry method comprising the steps of:

applying a 90° RF pulse and a 180° RF pulse, said pulses of frequency to affect the nuclei under observation, said 90° and 180° pulses separated by a time interval of t,

observing the resulting echo (FID) signal after another time interval of t, and

applying a decoupling signal comprising a strong noise-modulated RF signal of a frequency to affect nuclei that are not to be observed, the strong noise-modulated RF signal acting to decouple the nuclei not observed over a broad range, the application of the RF decoupling signal being terminated before the beginning of the observation of the echo signal.

4,641,097

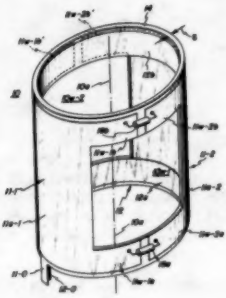
ELLIPTICAL CROSS-SECTION SLOTTED-TUBE RADIO-FREQUENCY RESONATOR FOR NUCLEAR MAGNETIC RESONANCE IMAGING

Paul A. Bottomley, Clifton Park, and John F. Schenck, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 10, 1984, Ser. No. 609,043

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—318 **21 Claims**



1. A slotted-tube radio-frequency resonator, for magnetic resonance imaging at Larmor frequencies associated with a static magnetic field of magnitude greater than about 0.5 Tesla, comprising:

first and second complementary outer structure portions, each having a generally I-shaped electrode having a central band with opposed ends and having one of four wing portions extending from each of a pair of opposed locations substantially at each opposed end thereof; each of said first and second complementary outer structure portions being disposed with the end of each of the four wing portions being spaced from a complementary adjacent one of the wing portions of the other outer structure portion and with both of said outer structure portion electrodes forming a tube having a substantially elliptical cross-section in planes substantially perpendicular to a central axis of said resonator;

means for reactively coupling each of the wing portion ends to the complementary adjacent wing portion end;

first and second guard ring members, each having an elliptical cross-section in a plane substantially perpendicular to the central axis of said resonator and each positioned inwardly of at least the adjacent wing portions at an associated one of the opposed ends of said bands;

dielectric means for insulatively separating each of said first and second guard ring members from the overlying outer structure portions;

means for applying a first potential to only one selected one of said first and second outer structure portion bands; and

means for applying another potential to that one of said first and second guard ring members adjacent to said selected one of said bands.

4,641,098

PARALLEL SINGLE TURN SADDLE RESONATOR FOR NUCLEAR MAGNETIC RESONANCE SIGNAL RECEPTION

Francis D. Doty, Columbia, S.C., assignor to Doty Scientific, Inc., Columbia, S.C.

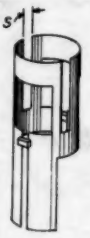
Filed Mar. 15, 1985, Ser. No. 712,080

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—322 **2 Claims**

1. A parallel single turn saddle resonator for inducing or detecting transverse nuclear magnetization in a sample, said

resonator comprising an even number of inductor loops, said loops formed to the contour of one or more substantially concentric cylindrical surfaces and located symmetrically on at least one axis of a pair of mutually orthogonal axes which



intersect orthogonally the axis of said cylindrical surface(s) at a given point, said loops on a given axis all electrically connected in parallel by suitable coupling means, and each loop including at least one break for the insertion of a capacitor.

4,641,099

METHODS FOR ENHANCING MAPPING OF THERMAL FRONTS IN OIL RECOVERY

David O. Lee; Paul C. Montoya, and James R. Wayland, Jr., all of Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Mar. 30, 1984, Ser. No. 595,011
Int. Cl.[4] G01V *3/00*; E21B *47/00*
U.S. Cl. 324—323 **13 Claims**

1. A method for enhancing the resistivity contrasts of a thermal front produced by enhanced oil recovery techniques in a production field, to allow its detection by a controlled source audio frequency magnetotelluric (CSAMT) technique, comprising the steps of:

(a) preparing a CSAMT-determined topological resistivity map of the production field;

(b) injecting a solution of a dopant material into the production field at a concentration effective to alter the resistivity associated with the thermal front; said dopant material having a high cation exchange capacity and being soluble in the conate water of the production field;

(c) preparing a CSAMT-determined topological resistivity map of the production field while said dopant material is moving therethrough; and

(d) mathematically comparing the maps from step (a) and step (c) to determine the location of the thermal front.

4,641,100

MULTIFREQUENCY METHOD FOR DIRECT AIRBORNE ELECTROMAGNETIC PROSPECTING OF HYDROCARBON DEPOSITS

Jan Dziwinel, Cracow, Poland, assignor to Instytut Gornictwa Naftowego i Gazownictwa, Cracow, Poland

Filed Jun. 4, 1982, Ser. No. 385,228
Claims priority, application Poland, Jun. 10, 1981, 231633
Int. Cl.[4] G01V *3/16, 3/165*
U.S. Cl. 324—330 **1 Claim**

1. A method of direct airborne electromagnetic prospecting of hydrocarbon deposits, comprising the steps of:

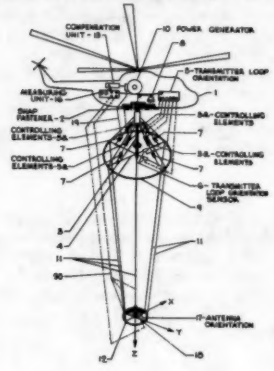
(a) transmitting many primary electromagnetic fields over an area comprising known hydrocarbon bearing and known barren locations, said many primary electromagnetic fields being transmitted from an induction transmitter loop mounted on a helicopter over many frequencies within the range of from 0.1 to 10 Hz, with many helicopter altitudes and with many positions of the plane of the induction transmitter loop;

(b) detecting, over each of a number of said known hydrocarbon bearing and known barren locations, any deviation of amplitude and phase of all said many primary electromagnetic fields due to secondary electromagnetic fields over said known locations, said deviations of amplitude and phase being measured separately for each of the orthogonal electromagnetic components H_x, H_y, and H_z by means of three orthogonal induction receiver antennae, and separately for each combination of said frequencies, helicopter altitudes and positions of the plane of the induction transmitter loop;

(c) storing electronically said amplitude and phase data separately for each known hydrocarbon bearing and known barren location in said area;

(d) converting said amplitude and phase data for each said known location into a multidimensional vector which represents the geophysical pattern of said known location, each said vector being a function of helicopter flight altitude, frequency, transmitter loop direction and inclination angle and the three induction receiver antenna orientations;

(e) electronically processing said vectors to obtain the factors of discriminant functions on the basis of pattern recognition theory, cumulatively as flights over said known locations proceed, said discriminant functions being normalized such that they provide values between 0.8 and 1.0 for said locations over said known hydrocarbon bearing



locations, and values of −0.8 to −1.0 over said known barren locations, said values being a measure of probability level of petroleum presence and absence;

(f) transmitting said many primary electromagnetic fields over any designed number of measuring locations within an area to be explored;

(g) detecting, at said measuring locations, said deviations of amplitude and phase of said many primary electromagnetic fields due to secondary electromagnetic fields over said area to be explored;

(h) storing electronically said amplitude and phase data separately for each said measuring location;

(i) converting said amplitude and phase data into multidimensional vectors which represent the geophysical patterns of measuring locations within said area to be explored, said vectors being functions of flight altitude, frequency, transmitter loop direction and inclination angle, and the orientation of the three induction receiver antenna;

(j) processing electronically said vectors into a set of probability levels of petroleum presence or absence on the basis of pattern recognition theory cumulatively as flights over said measuring locations proceed, and probability level computed for measuring locations within said area to be explored, with the use of said normalized discriminant

functions, selecting electronically, over said measuring locations within said area to be explored, the measuring locations having a high probability level, i.e. a pattern vector similar to those of points over said known locations; and

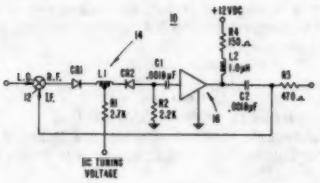
(k) visually indicating and presenting thus computed probability levels on a monitor and providing a map of hydrocarbon occurrence probability contours.

4,641,101

WIDEBAND, MICROWAVE REGENERATIVE DIVIDER WITH VARACTOR TUNING

Harold N. Selim, Wichita, Kans., assignor to IFR, Inc., Wichita, Kans.

Filed Oct. 25, 1984, Ser. No. 664,556
Int. Cl.[4] H03B *19/05*; H03L *7/00*
U.S. Cl. 328—25 **15 Claims**



1. A wideband microwave regenerative divider with varactor tuning, comprising:

(a) a source of RF capable of producing RF signals at different frequencies above about 1 GHz;

(b) a mixer having first and second inputs and an output, said first input being coupled to said source; and

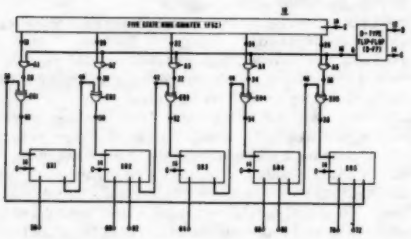
(c) a varactor-tuned filter with means for tuning to a subharmonic of the frequencies of said RF signals, said filter having a varactor and inductor connected together between said mixer output and said second mixer input, and a tuning voltage input connected to said varactor.

4,641,102

RANDOM NUMBER GENERATOR

Kenneth B. Coulthart, Hackettstown; Robert C. Fairfield, Randolph, and Robert L. Mortenson, Mountain Lakes, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 17, 1984, Ser. No. 641,913
Int. Cl.[4] H03K *13/00*; H03B *29/00*
U.S. Cl. 328—62 **4 Claims**



1. Circuitry comprising:

a sample-and-hold circuit having first and second input terminals and an output terminal and being connected to detect successive levels of a signal applied to the first input terminal at points in time which are determined by occurrences of a preselected portion of a repetitive signal applied to the second input terminal and to generate at the output terminal sample-and-hold output signals which are representative of the levels of the signal applied to the first input terminal, each of the levels of the sample-and-hold output signal being held until the preselected portion of the signal applied to the second input terminal recurs;

a plurality of exclusive-OR gates each of which having first and second input terminals and an output terminal;

gating means having an input terminal coupled to the output terminal of the sample-and-hold circuit and having a plurality of output terminals with each one of same coupled to a separate second input terminal of one of the plurality of exclusive-OR gates;

the gating means being adapted to successively apply each of the sample-and-hold output signals to the second input terminal of a different one of each of the plurality of exclusive-OR gates;

a plurality of shift registers, each of the registers comprising a first and a last stage and having an input terminal coupled to the first stage thereof, and further having a first output terminal coupled to a last stage thereof;

the output terminal of each of the exclusive-OR gates being coupled to the input terminal of a separate one of the shift registers;

the first output terminal of a first of the shift registers being coupled to the first input terminal of a second of the exclusive-OR gates;

the first output terminal of each successive shift register being coupled to the first input terminal of the next successive exclusive-OR gate, with the first output terminal of the last shift register being coupled to the first input terminal of the first of the exclusive-OR gates; and

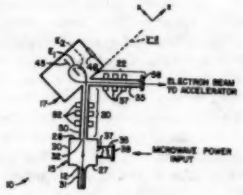
circuitry output terminals being coupled to selected stages of the plurality of shift registers.

4,641,103

MICROWAVE ELECTRON GUN

John M. J. Madey, 2120 Amherst St., Palo Alto, Calif. 94306, and Glen A. Westenskow, Palo Alto, Calif., assignors to John M. J. Madey, Palo Alto, Calif.

Filed Jul. 19, 1984, Ser. No. 632,757
Int. Cl.[4] H01J *29/54, 29/58, 29/80, 29/84*
U.S. Cl. 328—228 **22 Claims**



1. An electron gun comprising:

a thermionic cathode

RF cavity means defining an internal volume for supporting an electromagnetic field having a high-gradient electric component within said volume, said RF cavity means having first and second wall portions, said wall portions being separate from each other, said second wall portion being formed with an exit aperture; and

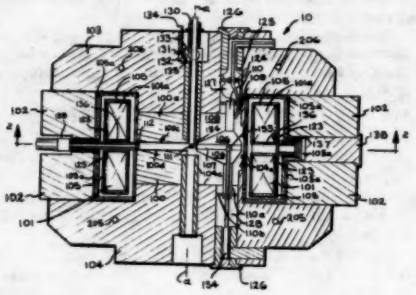
means for mounting said cathode at a position proximate said first wall portion such that electrons emitted from said cathode enter said volume and are subjected to said electric field component and accelerated thereby so as to pass through said exit aperture;

said means for mounting being operable to maintain said cathode at substantially the same RF voltage as said first wall portion and to provide thermal isolation between said cathode and said first wall portion.

4,641,104
SUPERCONDUCTING MEDICAL CYCLOTRON

Henry G. Blosser, East Lansing, Mich.; Richard J. Burleigh, Berkeley, Calif.; Gabe F. Blosser, Haslett, and Emanuel B. Jemison, Kalamazoo, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Apr. 26, 1984, Ser. No. 604,089
Int. Cl.[4] H05H *13/00*
U.S. Cl. 328—234 21 Claims



1. In a superconducting cyclotron apparatus which generates a beam of high velocity particles comprising atomic particles and subparticles thereof to be directed at an object to be irradiated from spirally accelerated charged particles around a cyclotron axis which form the beam or which impinge upon a target to produce the beam and including inlet and outlet conduit means for supplying and removing liquified gas to and from a vessel around superconducting coils supplied by electrical leads inside the vessel which pass around spaced apart iron poles so as to generate a magnetic field between the poles when current is supplied to the coils and which function to produce the spirally accelerated charged particles with an oscillatory electrical field, the improvement which comprises:

a Joule-Thompson effect constricted capillary tube leading to a semi-circular tube adjacent to and in heat transfer relationship with both coils and the liquified gas in the vessel, with the semi-circular tube connected to an exit tube from the vessel and cyclotron, wherein in operation of the cyclotron liquified gas is at an elevated pressure P_1 in the vessel and a portion of the liquified gas in the vessel flows through the capillary tube and expands into the semi-circular tube at a pressure P_2 lower than P_1 thus cooling the semicircular tube and thus the liquified gas in the vessel and the coils and then the liquified gas is removed through the exit tube, and wherein the cooled semi-circular tube subcools the liquified gas in the coil vessel thus preventing the formation of bubbles in this vessel due to heat flowing into the liquified gas in the vessel along the electrical leads supplying current to the coils.

4,641,105
APPARATUS AND METHOD FOR NOISE REDUCTION IN A LINEAR AMPLIFIER

Neil P. Albaugh, and Gordon R. Kane, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

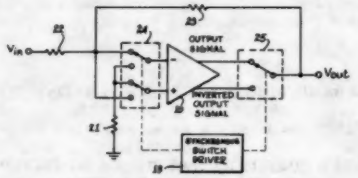
Filed Oct. 7, 1985, Ser. No. 784,992
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—9 13 Claims

1. An amplifying circuit comprising:

a differential amplifier;

an input switch for applying an input signal to a first terminal of said amplifier during a first period and for applying said input signal to a second terminal of said differential amplifier during a second period, said input switch passing both D.C. components and A.C. components substantially without attentuation; and

output switch, said output switch applying a second output terminal of said differential amplifier to an output terminal

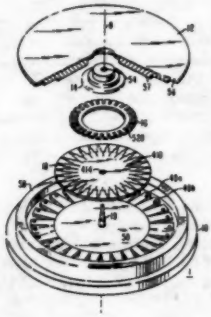


during a first period and for applying the output signal of a first output terminal of said amplifier to an output terminal during said second period, said output switch passing both D.C. components and A.C. components substantially without attenuation.

4,641,106
RADIAL POWER AMPLIFIER

Erwin F. Belohoubek, Middlesex County, and Daniel W. Bechtle, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 21, 1985, Ser. No. 736,302
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—286 17 Claims



16. A power amplifier comprising:

an input port centered on an axis and adapted for receiving signal to be amplified;

a first radial transmission line centered on said axis and coupled to said input port for propagating said signal to be amplified radially away from said input port;

radial transmission line to microstrip transition means centered on said axis and coupled to said radial transmission line for coupling a portion of said signal to be amplified to each of a first plurality of microstrip terminals;

a plurality equal to said first plurality of coaxial transmission lines, each of said coaxial transmission lines having a first end and a second end, each of said first ends being coupled to one of said first microstrip terminals, and each of said coaxial transmission lines extending at right angles thereto and parallel with said axis;

an output port on said axis;

a second radial transmission line centered on said axis and coupled to said output port for propagating amplified signal to said output port;

microstrip transmission line to radial transmission line transition means centered on said axis for receiving portions of

said amplified signal at a plurality equal to said first plurality of second microstrip terminals and for coupling said portions of said amplified signal to said second radial transmission line; and

a plurality equal to said first plurality of amplifying means, each of said amplifying means having an input terminal coupled to said second end of one of said coaxial transmission lines for receiving one of said portions of said signal to be amplified, and each of said amplifying means having an output terminal coupled to one of said second microstrip terminals for producing one of said portions of said amplified signal.

4,641,107

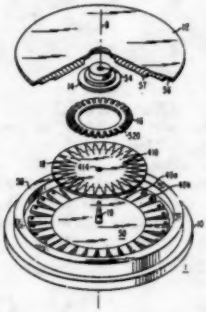
PRINTED CIRCUIT RADIAL POWER COMBINER WITH MODE SUPPRESSING RESISTORS FIRED AT HIGH TEMPERATURE

David Kalokitis, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 21, 1985, Ser. No. 736,346

Int. Cl.[4] H03F 3/60; H01P 5/12

U.S. Cl. 330—286 **15 Claims**



13. A amplifier, comprising:

a conductive central disc-like member including a central axis and also including first and second flat sides which are parallel to a plane orthogonal to said central axis;

an input port adapted for receiving signal to be amplified and for coupling said signal to be amplified to a point near the junction of said central axis and said first flat side of said central disc-like member;

power splitting means coupled to said input port and including a flat conductive member spaced from said first flat side of said central disc-like member to form a first radial waveguide for conveying said signal to be amplified from said input port to points at a first radius therefrom, and also including radial-waveguide-to microstrip transition means for splitting said signal to be amplified into a first plurality of portions, each of said portions appearing on one of a first plurality of microstrip terminals equally spaced along a circle spaced by a second radius from said central axis;

a second plurality of microstrip terminals spaced by a predetermined distance from said second side of said central disc-like member;

an output port;

power combining means coupled to said output port and including a flat conductive portion of a printed circuit board spaced from said second flat side of said central disc-like by a dielectric portion of said printed circuit board to form a second radial waveguide, and also including microstrip to radial waveguide transition means coupled to said second plurality of microstrip terminals and to said second radial waveguide for coupling to said output port combined signal from said second plurality of microstrip terminals, said microstrip to radial waveguide transition means including a plurality equal to said second plurality of radial slots formed in the edge of said second radial waveguide;

a third plurality of amplifiers, said third plurality being equal to each of said first and second pluralities, each of said amplifiers including an input terminal coupled to one of said first plurality of microstrip terminals and an output terminal coupled one of said second plurality of microstrip terminals, each of said amplifiers also being biased to amplify the signals received from said one of said first microstrip terminals to produce an amplified signal at said one of said second plurality of microstrip terminals;

a metal ring having an outer diameter less than the outer diameter of said second radial waveguide and including a plurality equal to said second plurality of radial slots each of which is larger than the corresponding radial slot in said radial waveguide, said metal ring being electrically and thermally bonded to said flat conductive portion of said printed circuit board with said slots of said metal ring being registered with said slots in said radial waveguide; and

resistance means bonded to said metal ring and electrically coupled across said slots in said metal ring.

4,641,108

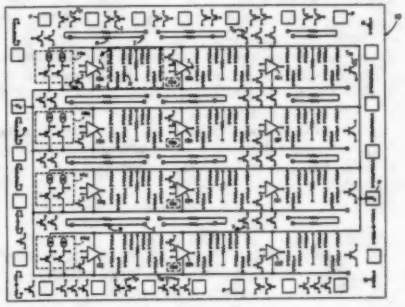
CONFIGURABLE ANALOG INTEGRATED CIRCUIT

Harry A. Gill, Jr., Cupertino, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 16, 1985, Ser. No. 788,194

Int. Cl.[4] H03F 3/04

U.S. Cl. 330—307 **16 Claims**



16. A method of providing an integrated circuit comprising the steps of:

providing a plurality of active circuit elements interconnected in a first level of a semiconductor body to provide a preconfigured gain stage and a plurality of preconfigured output stages; and

electrically interconnecting the gain stage to a selected one, or ones, of the plurality of output stages at a second level of the semiconductor body.

4,641,109

CMOS CRYSTAL CONTROLLED OSCILLATOR

Hiroshi Yokouchi, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,877

Claims priority, application Japan, Dec. 12, 1984, 59-260882

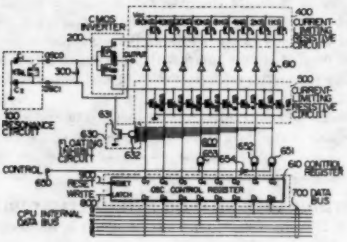
Int. Cl.[4] H03B 5/30

U.S. Cl. 331—116 FE **5 Claims**

1. A CMOS crystal controlled oscillator for use in a semiconductor device having an internal data bus comprising:

(a) a CMOS inverter composed of P and N type MOS FETs which are connected in series with each other;

(b) a crystal element connected between signal input and output nodes of said CMOS inverter;
(c) a first capacitor connected between said signal input node of said CMOS inverter and a ground potential;
(d) a second capacitor connected between said signal output node of said CMOS inverter and said ground potential;
(e) a feedback resistor connected between the signal input and output nodes of said CMOS inverter for providing a DC bias potential to said CMOS inverter;
(f) a first current-limiting circuit connected between the P type MOS FET of said CMOS inverter and a power source potential for limiting a current through said CMOS inverter; said first current-limiting circuit comprising a plurality of P type MOS FETs which are connected in parallel;



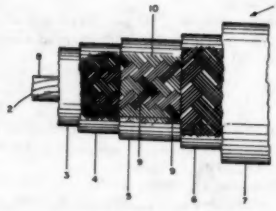
(g) a second current-limiting circuit connected between said N type MOS FET of said CMOS inverter and said ground potential for limiting a current flowing through said CMOS inverter; said second current-limiting circuit comprising a plurality of N type MOS FETs which are connected in parallel; and
(h) a control register for controlling said first and second current-limiting circuits based on data on said internal data bus to reduce power consumption of said crystal control oscillator; wherein said plurality of P type MOS FETs are controlled selectively in response to data from said control register and wherein said plurality of N type MOS FETs are controlled selectively in response to data from said control register.

4,641,110

SHIELDED RADIO FREQUENCY TRANSMISSION CABLE HAVING PROPAGATION CONSTANT ENHANCING MEANS

Kenneth L. Smith, Amesbury, Mass., assignor to Adams-Russell Company, Inc., Amesbury, Mass.

Filed Jun. 13, 1984, Ser. No. 620,121
Int. Cl.⁴ H01P *3/06*
U.S. Cl. 333—12 **23 Claims**



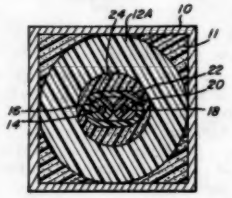
1. A cable comprising
at least one center conductor,
a generally cylindrical dielectric means surrounding said center conductor,
an inner metallic sheath generally concentric with said center conductor and surrounding said dielectric to contain electromagnetic fields and to define a transmission path within said sheath for transmission of radio-frequency signals with a relatively low propagation function,
at least one outer metallic sheath surrounding and separated from said inner metallic sheath to define a second transmission path between said inner and outer metallic sheaths,
the space between said separated metallic sheaths containing a dielectric material and an electrically conductive enhancing means, said dielectric material filling a predominate portion of said space,
said electrically conductive enhancing means being configured to increase the propagation function of said transmission path between said inner and outer metallic sheaths to a value significantly greater than twice said low propagation function of said transmission path within said inner metallic sheath.

4,641,111

MICROWAVE COUPLER

Harry F. Chapell, Maynard, Mass., assignor to Sage Laboratories, Inc., Natick, Mass.

Continuation of Ser. No. 550,774, Nov. 14, 1983, Pat. No. 4,547,753. This application Sep. 12, 1985, Ser. No. 775,310
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.⁴ H01P *5/18*
U.S. Cl. 333—115 **16 Claims**

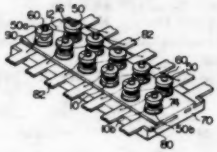


1. A microwave coupled line device operated over a frequency range having a predetermined center frequency and comprising:
means defining an outer conductor,
first and second inner conductors at least one of which has insulation bonded thereto and separated by the thickness of said insulation there between,
an insulating sleeve disposed in said outer conductor and adapted to accommodate said first and second inner conductors,
a means for filling the void between the insulating sleeve and the inner conductors with an insulating material having a relatively high dielectric constant particularly in comparison with the dielectric constant of the insulating sleeve and in the range of a dielectric constant of 2.6–3.5,
the means for filling having a dielectric constant selected in comparison with the dielectric constant of the insulating sleeve so as to decrease the even mode velocities so as to approach equalization between the even and odd mode propagation velocities,
and means for filling any void between the insulating sleeve and outer conductor.

4,641,112
DELAY LINE DEVICE AND METHOD OF MAKING SAME

Masami Kobayakawa, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Mar. 4, 1986, Ser. No. 836,099
Claims priority, application Japan, Mar. 12, 1985, 60-35216[U]; Mar. 13, 1985, 60-49710; Mar. 25, 1985, 60-42757[U]; Sep. 25, 1985, 60-146468[U]; Oct. 9, 1985, 60-154818[U]; Oct. 9, 1985, 60-225781; Nov. 14, 1985, 60-175140[U]
Int. Cl.[4] H03H 7/32, 3/00; H05K 13/04
U.S. Cl. 333—140 21 Claims

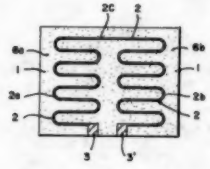


1. A lumped constant type delay line device wherein a plurality of cores having coils contiguously wound thereon, are mounted on a plastic base plate, characterized in that said plastic base plate is molded with a plurality of conductor plates each integrally provided with connecting portions and terminals being buried therein in such a manner that said connecting portions are exposed at one surface of said base plate and said terminals extend externally thereof; capacitors are securely connected to said connecting portions; coils are mounted on the other surface of said base plate, said coils having taps thereof connected to electrodes provided on the top end surfaces of the cores respectively; and said electrodes are electrically connected to said terminals respectively.

4,641,113
DELAY LINE DEVICE HAVING SYMMETRICAL DELAY PATH

Juichiro Ozawa, Kyoto, Japan, assignor to Susumu Industrial Co., Ltd., Kyoto, Japan and Thin Film Technology Corporation, North Mankato, Minn.

Filed May 2, 1984, Ser. No. 606,292
Claims priority, application Japan, May 2, 1983, 58-78063
Int. Cl.[4] H01P 9/00
U.S. Cl. 333—161 3 Claims

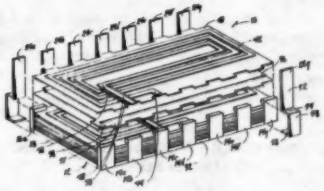


1. A delay line device which comprises a substrate made of an electrically insulating material, a transmission path formed by a thin film containing copper on one surface of the substrate, said transmission path including at least two parts arranged in a symmetrical manner, and a ground electrode formed on another opposing surface of the substrate, each of said parts being of a zig-zag configuration comprising a plurality of generally straight sections connected by a plurality of bent sections, said parts being adjacent each other and symmetrical about an axis intermediate said parts and extending in a direction perpendicular to said generally straight sections, the uppermost straight sections of said parts being contiguous and electrically connected, first connecting electrodes formed adjacent the lower most straight sections on said one surface of the substrate and respective ones of said first electrodes being connected with a respective end of the transmission path, and second connecting electrodes formed on said another opposing surface of the substrate and connected with portions of the ground electrode, said second connecting electrodes being spaced from each other.

4,641,114
THICK FILM DELAY LINE COMPRISING A PLURALITY OF STACKED DELAY ASSEMBLIES FORMED BY A PRINTING PROCESS

Herman R. Person, Columbus, Nebr., assignor to Dale Electrons, Inc., Columbus, Nebr.

Continuation of Ser. No. 478,841, Mar. 25, 1983, abandoned.
This application Jul. 31, 1985, Ser. No. 761,598
Int. Cl.[4] H01P 9/00
U.S. Cl. 333—161 3 Claims



1. A thick film delay line comprising:

a dielectric substrate having an upper surface, a lower surface, and a plurality of perimetric edges;

at least first, second and third delay circuit assemblies, each of said delay circuit assemblies comprising a solid sheet of conductive material, a first printed layer of dielectric material printed over and completely covering said solid conductive sheet, a spiral conductor printed over said first dielectric layer and having an outer spiral end and an inner spiral end, said inner spiral end crossing over a cross-over portion of said spiral conductor, printed dielectric means interposed between said cross over portion of said spiral conductor and said inner spiral end to prevent electrical contact therebetween, and a second printed dielectric layer printed over and completely covering all of said spiral conductor so that said entire spiral conductor is sandwiched between said first and second printed dielectric layers;

said solid conductive sheet of said first delay circuit assembly being printed on said upper surface of said substrate;

said solid conductive sheets of said second and third delay circuit assemblies being printed on said second dielectric layers of said first and second delay circuit assemblies, respectively;

said third delay circuit assembly being positioned a predetermined height above said upper surface of said substrate;

at least a conductive ground contact pad and conductive first, second, third and fourth contact pads mounted to said substrate along one of said peripheral edges thereof in spaced relation to one another, each of said ground, first, second, third and fourth contact pads extending above said upper surface to a height at least equal to said predetermined height of said third delay circuit assembly above said upper surface of said substrate;

said inner and outer coil ends of said first delay circuit assembly extending horizontally from between said first and second dielectric layers of said first delay circuit assembly with one of said inner and outer coil ends of said first delay line being electrically connected to said first contact pad and with the other of said inner and outer coil ends of said first delay line being electrically connected to said second contact pad;

said inner and outer coil ends of said second delay circuit assembly extending horizontally from between said first and second dielectric layers of said second delay circuit assembly with one of said inner and outer coil ends of said second delay circuit assembly being electrically connected to said second contact pad and the other of said inner and outer coil ends of said second delay circuit assembly being connected to said third contact pad;

said inner and outer coil ends of said third delay circuit assembly extending horizontally from between said first and second dielectric layers of said third delay circuit assembly with one of said inner and outer coil ends of said third delay circuit assembly being in electrical contact with said third contact pad and the other of said inner and outer coil ends of said third delay circuit assembly being in electrical contact with said fourth contact pad, whereby said conductive coils of said first, second, and third delay circuit assemblies are connected in series with one another;

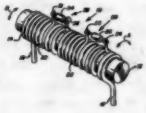
each of said conductive sheets of said first, second and third delay assemblies having a horizontal lead extending horizontally into electrical contact with said ground contact pad.

4,641,115

RADIO FREQUENCY CHOKES HAVING TWO WINDINGS AND MEANS FOR DAMPENING PARASITIC RESONANCES

Peter D. Bailey, Phoenix, Ariz., assignor to Texscan Corporation, Phoenix, Ariz.

Filed Jun. 4, 1984, Ser. No. 617,013
Int. Cl.[4] H03H 7/09
U.S. Cl. 333—181 **31 Claims**



5. A radio frequency choke for use in the frequency diplexing circuits of the equipment of a cable transmission and distribution system over which radio frequency signals and single phase AC power signals are simultaneously transmitted, said radio frequency choke comprising:

(a) an elongated core of ferromagnetic material;

(b) a first conductor wound around said core to form a primary choke winding having a predetermined number of turns and having a first end terminal for coupling said primary choke winding to ground and a second opposite end terminal for coupling said primary choke winding to the cable system;

(c) a first swamping circuit means for dampening parasitic resonances which occur in said primary choke winding at the low end of the frequency bandwidth of the radio frequency signals which are transmitted over the cable system, said first swamping circuit means including,

I. a second conductor wound around said core to form a first secondary winding having a predetermined number of turns which are fewer than the number of turns of said primary choke winding and having first and second end terminals, and

II. a first resistor having a first predetermined value interconnected between the first and second end terminals of the first secondary winding of said first swamping circuit means; and

(d) a second swamping circuit means for dampening parasitic resonances which occur in said primary choke winding at the high end of the frequency bandwidth of the radio frequency signals which are transmitted over the cable system, said second swamping circuit means including,

I. a third conductor wound around said core to form a second secondary winding having a predetermined number of turns which are fewer than the number of turns of said primary choke winding and having first and second end terminals, and

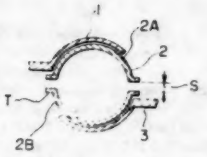
II. a second resistor having a second predetermined value interconnected between the first and second end terminals of the second secondary winding of said second swamping circuit means.

4,641,116

MICROWAVE FILTER

Junichi Shibata, and Hiroshi Kojima, both of Saitama, Japan, assignors to Pioneer Ansafone Manufacturing Corporation, Saitama, Japan

Filed Nov. 25, 1985, Ser. No. 801,995
Claims priority, application Japan, Nov. 28, 1984, 59-249758
Int. Cl.[4] H01P 1/203, 7/08
U.S. Cl. 333—204 **5 Claims**



1. A passive microwave bandpass filter, comprising:

(a) a dielectric substrate;

(b) an input matching circuit (1) disposed on the substrate,

(c) an output matching circuit (3) disposed on the substrate and having an end portion spaced from an end portion of the input matching circuit, and

(d) a unit-wavelength resonator (2) disposed between said end portions of the input and output matching circuits,

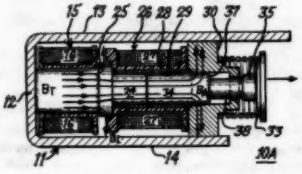
(e) said unit-wavelength resonator comprising a pair of generally U-shaped strip lines (2A, 2B) disposed opposite each other with ends facing but spaced from each other across equal width gaps (S) to define an otherwise closed loop, and said strip line ends having outwardly extending, parallel stubs (T) defining therebetween said gaps, the width of said gaps and the outwardly extending length of said stubs determining the passband of the filter.

4,641,117

COMBINED ACCESSORY AND TRIP ACTUATOR UNIT FOR ELECTRONIC CIRCUIT BREAKERS

Henry G. Willard, Wethersfield, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,979
Int. Cl.[4] H01H 83/12
U.S. Cl. 335—7 **5 Claims**



1. A combined trip actuator and undervoltage release for electronic circuit breakers comprising:

magnetic support means;

a trip coil mounted within said support means having a movable armature extending partially within said trip coil and biased into a tripping position by a compression spring;

an undervoltage release coil within said support means providing a predetermined magnetic holding flux to retain said armature in a non-trip position against said compression spring when said undervoltage release coil is energized by a first predetermined voltage; and

a magnetic flux diverter intermediate said undervoltage release coil and said trip coil for diverting said magnetic holding flux away from said armature when said trip coil is energized to allow said armature to extend to said tripping position under the urgence of said compression spring, said flux diverter comprising a dual-diameter magnetic cylinder the smaller diameter being arranged partially within said trip coil, the larger diameter being arranged in abutment with said undervoltage release coil, said undervoltage release coil providing less than said predetermined holding flux to said armature when said undervoltage release coil is energized by a voltage less than said predetermined voltage whereby said armature becomes extended to said tripping position under the urgence of said compression spring.

4,641,118

ELECTROMAGNET AND ELECTROMAGNETIC VALVE COIL ASSEMBLIES

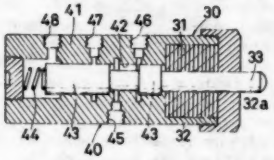
Tokuzo Hirose, and Ikuo Inoue, both of Osaka, Japan, assignors to Hirose Manufacturing Co., Ltd., Osaka, Japan

Filed Jan. 30, 1985, Ser. No. 696,433

Claims priority, application Japan, Aug. 6, 1984, 59-120856[U]; Aug. 17, 1984, 59-172191

Int. Cl.⁴ H01F 7/08

U.S. Cl. 335—282 **4 Claims**



1. An electromagnet comprising:

a plurality of first planar insulative substrates, each having a spiral shaped conductor on only one side thereof, each spiral shaped conductor extending in a first direction between a radially inner terminal end and a radially outer terminal end thereof;

a plurality of second planar insulative substrates, each having a spiral shaped conductor on only one side thereof, each spiral shaped conductor extending in a second spiral direction between a radially inner terminal end and a radially outer terminal end thereof, said second spiral direction being a reverse of said first spiral direction;

said plurality of first planar insulative substrates being stacked in alternating relationship with said plurality of second planar insulative substrates, the stack of said plurality of first and second planar insulative substrates having a hole extending centrally therethrough with respect to each spiral shaped conductor;

each of said plurality of first planar insulative substrates having said radially inner terminal end connected to a cylindrical conductor extending therethrough and electrically connected to an abutting radially inner terminal end on a respective one of said plurality of second planar insulative substrates;

each of said plurality of second planar insulative substrates having said radially outer terminal end connected to a cylindrical conductor extending therethrough and electrically connected to an abutting radially outer terminal end on a respective one of said plurality of first planar insulative substrates, whereby each sprial shaped conductor is electrically connected together in series;

a housing having said stack of planar insulative substrates mounted therein; and

a ferromagnetic core slidably received in said hole in said stack of planar insulative substrates, said ferromagnetic core being moved with respect to said stack of planar insulative substrates when a direct electric current is passed through each spiral shaped conductor of said stack of planar insulative substrates.

4,641,119

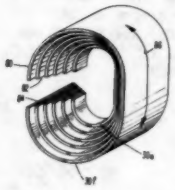
LAMINAR MAGNET FOR MAGNETIC RESONANCE DEVICE AND METHOD OF MAKING SAME

John F. Moore, Lake Bluff, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1985, Ser. No. 725,340

Int. Cl.⁴ H01F 3/00

U.S. Cl. 335—297 **27 Claims**



1. A magnet for use in a magnetic resonance imaging device comprising:

(a) means for generating a magnetic field; and

(b) means for providing a return path for said magnetic field including a plurality of ribbon strips of magnetically conductive material, said strips each bent along their lengths to form a curved cross section along the edge of each strip, with said cross section similar in shape from strip to strip, and said strips stacked together to form a return path having a cross-section of said shape.

4,641,120

SAFETY FUSE ASSEMBLY PROVIDED WITH AN ELECTRO-OPTICAL INDICATOR DEVICE

Karl-Walter Bonfig, Asternweg 17, 5910 Kreuztal; Jorg Himmel, Am Neuen Schacht 41, 5912 Hilchenbach, and Ulrich Kuipers, Grobestrasse 4, 5900 Siegen, all of Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,574

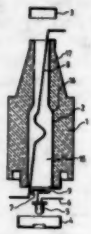
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441588; Apr. 17, 1985, 3513833

Int. Cl.⁴ H01H 85/32

U.S. Cl. 337—242 **13 Claims**

1. A safety fuse assembly comprising two contacts, a substantially hollow cylindrical insulating body extending between the contacts and having an exterior surface, and an interior surface defining the interior body hollow, a fuse wire extending between said two contacts through the cylinder hollow, an electrically conductive highly resistive layer located on one of said body surfaces, said layer having at least one tapping point,

and an optoelectrical indicator means connected in series to at least one of said layer tapping points,



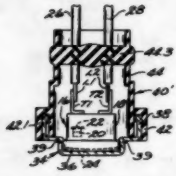
said optoelectrical indicator means and said electrically conductive highly resistive layer being electrically connected in parallel to said fuse wire.

4,641,121

SEALED ELECTRICAL SWITCH AND MOUNTING THEREFOR

Henry J. Boulanger, Nicholasville, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1985, Ser. No. 794,888
Int. Cl.[4] H01H *37/04, 37/52*
U.S. Cl. 337—380 19 Claims



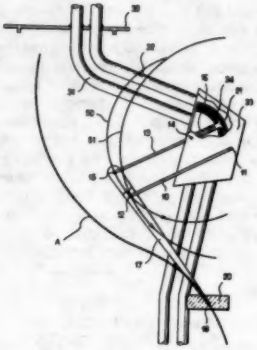
1. A switch having an open ended body with a movable and a stationary electrical contact disposed in the body, the movable contact movable into and out of engagement with the stationary contact, a heat responsive member disposed in the body operatively connected to the movable contact to cause the movable contact to assume one of it spositions of engagement or disengagement depending on the temperature of the heat responsive member, a heat conductive cap having a heat sensing surface closing the open end of the body and thermally coupled to the heat responsive member, terminal means on the body to provide electrical connections to the movable and stationary contact and insulated electrical leads connected to the terminal means and projecting from the body, an improved liquid tight seal for the switch comprising a heat conductive metallic cup shaped member having a tubular side wall and closed end formed with a recessed portion in the closed end, the heat conductive cap received in the recessed portion with the heat sensing surface thermally coupled to the closed end, the closed end clampingly engaged with the heat conductive cap, a continuous layer of adhesive about the side wall of the cup shaped member, a plastic sleeve having first and second open ends, one end received over the tubular side wall and the second extending above the switch, the first end of the sleeve being bonded to the side wall through the adhesive to form a liquid tight seal between the sleeve and the cup shaped member, the leads extending through the second end of the sleeve, and the second end of the sleeve being bonded to itself and to the insulation of the leads to form a liquid tight seal between the sleeve and the insulated sleeves of the leads.

4,641,122

DEVICE FOR MEASURING THE LEVEL OR VOLUME OF LIQUID IN A TANK

Yves Hennequin, La Celle St. Cloud, France, assignor to Jaeger, France

Filed Jan. 16, 1985, Ser. No. 692,058
Claims priority, application France, Jan. 17, 1984, 84 00648
Int. Cl.[4] H01L *10/14*
U.S. Cl. 338—33 12 Claims



1. In a device for detecting the level of liquid in a tank having a level provided with a movable float for following the level of liquid and cooperating with a transducer adapted to generate a signal representative of the position of said float, the improvement comprising:

(a) a common fixed support,

(b) two first parallel and approximately horizontal axial supports provided on said common fixed support,

(c) two arms mounted for pivoting movement on said common fixed support, respectively about said first axial supports,

(d) two second parallel axial supports spaced from but generally parallel to said two first axial supports, provided respectively on said two arms,

(e) a movable support member mounted for pivoting movment on said two arms respectively about said second axial supports, and

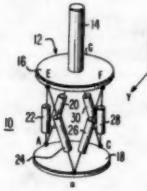
(f) a float mounted on said movable support member.

4,641,123

JOYSTICK CONTROL

James M. M. Whitehead, Lindenwold, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 30, 1984, Ser. No. 666,387
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—128 5 Claims



1. A joystick comprising:

a base;

a handle; and

a plurality of potentiometers coupled between the base and

the handle and directly connected thereto so as to provide at least three degrees of freedom of movement by said handle with respect to the base, the potentiometers connected to the base and handle so that said movement varies the electrical resistance of the potentiometers in relation to the direction and amount of movement.

5. A joystick comprising:

a base;

a handle; and

six potentiometers connected in pairs to three points on said handle and connected in different pairs to three points on said base so as to provide six degrees of freedom of movement by said handle with respect to said base so that the electrical resistance of said potentiometers varies corresponding to the direction and magnitude of said movement.

4,641,124

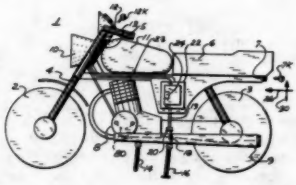
VEHICLE SECURITY ALARM

Dwin S. Davis, P.O. Box 66, Choctaw, Okla. 73020

Filed Sep. 13, 1982, Ser. No. 417,480

Int. Cl.[4] B60R *25/04*

U.S. Cl. 340—64 24 Claims



1. A motorized vehicle having an ignition switch, a vehicle battery, and an ignition system WHEREIN THE IMPROVEMENT COMPRISES

alarm emitting means capable of being turned on;

means for disabling said alarm emitting means at least when said ignition switch is on;

sensing means for turning on said alarm emitting means when said ignition switch is off when said vehicle is disturbed; and

means for blocking said disabling means when said battery is electrically connected to said ignition system but when said ignition switch is off.

4,641,125

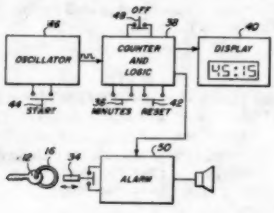
METER BEATER TIMER

Nastazio Pesa, 25-40 31st Ave., Long Island City, N.Y. 11106

Filed Sep. 25, 1985, Ser. No. 779,480

Int. Cl.[4] G08B *1/00*; G04B *47/00*; G04F *8/00*; A44B *15/00*

U.S. Cl. 340—309.15 4 Claims



1. A meter beater timer, comprising in combination:

(a) a timer housing;

(b) a interval timer, contained in said timer housing, wherein said interval timer is set to a preset time interval and counts backward from said preset timer toward zero;

(c) an alarm, contained in said timer housing;

(d) a stop button operatively coupled to said alarm, wherein said alarm sound when said interval timer has reached zero and wherein said alarm is turned off by depressing said stop button;

(e) a retractable chain connected to a key ring, such that said retractable chain is extended by the weight of said housing when a key attached to said key chain is inserted into an automobile ignition, and retracts into said timer housing when said key is removed from said ignition thereby releasing tension on said key and said key chain; and,

(f) means for activating said alarm when said key is removed from said ignition and said retractable chain retracts.

4,641,126

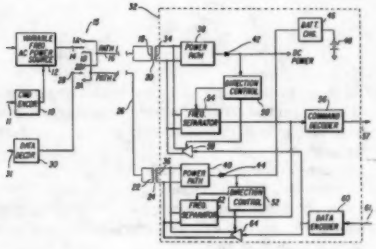
MULTIPLE-MODE ELECTRICAL POWER AND COMMUNICATIONS INTERFACE

Wayne D. Crowe, Houston, Tex., assignor to Ferranti-Subsea Systems, Ltd., London, England

Filed Dec. 7, 1984, Ser. No. 679,186

Int. Cl.[4] H04M *11/04*; H04B *3/20*

U.S. Cl. 340—310 A 16 Claims



1. A multiple-mode electrical power and communication interface, comprising:

means for generating an electrical power signal;

command encoding means coupled to said generating means for receiving and encoding command words into command signals exhibiting a plurality of discrete frequencies, and for applying said command signals to said generating means to modulate the instantaneous frequency of said electrical power signal, whereby said electrical power signal includes a command component and a power component;

data decoding means for receiving and decoding data signals;

first and second discrete couplers each having primary and secondary sides;

connecting means for providing electrically distinct first and second signal paths for simultaneously coupling said generating means and said data decoding means via selected ones of said first and second paths to the primary sides of different ones of said first and second couplers, one of said signal paths being coupled by said connecting means to conduct said electrical power signal and the other one of said signal paths being coupled by said connecting means to conduct said data signals;

a network normally located remotely from said command encoding means and separately coupled to said secondary sides of said first and second couplers, including:

command decoding means for decoding said command signals from said command component;

data encoding means for encoding and transmitting information as data signals; and

control means responsive to reception of said power component across said couplers for enabling said command

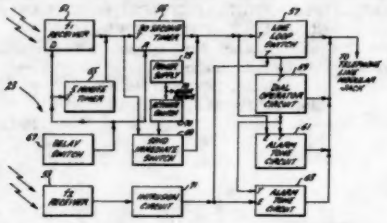
decoding means to receive said command signals via said one of said signal paths coupled to conduct said electrical power signal, for isolating said data encoding means from said one of said signal paths coupled to conduct said electrical power signal, and for enabling said data encoding means to transmit said data signals via the one of said signal paths coupled to conduct said data signals.

4,641,127

SECURITY AND FIRE PROTECTION SYSTEM

Dennis R. Hogan, 310-7th, Snohomish, Wash. 98290, and John K. Wright, 1695 Arthur, North Bend, Oreg. 97459

Filed Jan. 30, 1985, Ser. No. 696,467
Int. Cl.[4] G08B *19/00, 1/00*
U.S. Cl. 379—40 **8 Claims**



1. A premises protection system for protecting premises connected to the central office of a telco system by telephone lines against fire and/or intrusion, said premises protection system comprising:

(a) a telco central office comprising:

(1) an operator's console including display means;

(2) a switching network for selectively connecting telephone lines together, to other central offices and to said operator's console; and,

(3) automatic number identification circuitry connected to the display means of said operator's console for causing said display means to display the number of a calling telephone when said switching network connects a telephone line carrying an operator dial signal to said operator's console;

(b) a plurality of telephone lines, one end of each of said telephone lines connected to said switching network of said telco central office; and,

(c) a plurality of protected premises subsystems, one located at each premise to be protected, each of said premise to be protected also being located at the other end of one of said plurality of telephone lines, each of said protected premises subsystems comprising:

(1) a plurality of detector-transmitter units positioned about each of said protected premises, each of said detector-transmitter units including:

(i) a detector for detecting a predetermined condition and conditioning an output signal when said condition is detected; and,

(ii) a transmitter connected to said detector for receiving said conditioned output signal and producing a wireless radio frequency signal when said conditioned output signal is received; and,

(2) a receiver-alarm unit for:

(i) receiving said wireless radio frequency signals produced by said transmitters of said detector-transmitter units;

(ii) seizing the telephone line running from said protected premises to said switching network of said telco central office when a wireless radio frequency signal produced by the transmitters of one of said plurality of detector-transmitter units is received;

(iii) initially transmitting an operator dial signal to said telco central office via said seized telephone line; and,

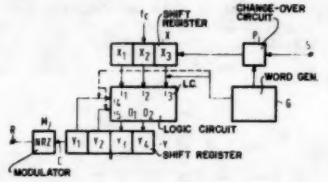
(iv) subsequently transmitting an alarm tone signal to said telco central office via said seized telephone line.

4,641,128

METHOD OF ENCODING A STREAM OF DATA BITS, ARRANGEMENT FOR PERFORMING THE METHOD AND ARRANGEMENT FOR DECODING THE STREAM OF CHANNEL BITS OBTAINED IN ACCORDANCE WITH THIS METHOD

Kornelis A. Schouhamer Immink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1984, Ser. No. 613,126
Claims priority, application Netherlands, Jan. 24, 1984, 8400212
Int. Cl.[4] H03M *5/14*
U.S. Cl. 340—347 DD **11 Claims**



2. A method of converting a stream of data bits of a binary source signal into a stream of channel bits of a binary channel signal in a transmission system, more specifically, a system for recording and reproducing a recording signal on a record carrier, the bit stream of the source signal being divided into a contiguous sequence of five authorized source words in accordance with the following Table, which authorized source words are converted into the associated channel words of the Table:

source words	channel words
10	0100
11	1000
0(1)	00
00(1)	0000
000	100100

characterized in that during this encoding operation, a synchronizing word is generated formed by 16 channel bits, the two first and the two last channel bits of this synchronizing word being a logic "0" and the intermediate pattern of channel bits comprises only two logic "ones" separated by nine "zeros", and that in order to obtain an unambiguous conversion of the two source signal data bits preceding a synchronizing word, the beginning of a synchronizing word in the stream of data bits of the source signal is indicated by the insertion of at least one source bit in the form a logic "0".

4,641,129

ANALOG TO DIGITAL CONVERTER WITH PARALLEL AND SUCCESSIVE APPROXIMATION STAGES

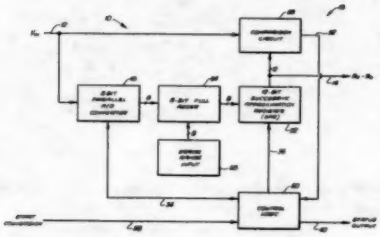
Tune Doluca, Santa Clara, and Ziya G. Boyacigiller, Hayward, both of Calif., assignors to Intersil, Inc., Cupertino, Calif.

Filed Feb. 9, 1984, Ser. No. 578,535
Int. Cl.[4] H03M *1/00*
U.S. Cl. 340—347 AD **8 Claims**

1. An analog to digital converter for converting an analog input signal to a digital representation having n bits which include a plurality of more significant bits and a plurality of less significant bits, the converter comprising:

flash analog to digital converter means for converting the analog input signal to an approximate digital representation wherein the flash converter includes a plurality of series connected resistors, each resistor having a comparator associated therewith for comparing the analog signal with the voltage at the associated resistor, and encoder means for encoding the output of the comparators to provide the more significant bits of the digital representation;

a register having n bit positions for storing an n-bit digital representation, said bit positions including positions for storing the plurality of more significant bits provided by the flash converter means, and positions corresponding to the plurality of less significant bits;



comparison means for comparing the analog value of the n-bit digital representation stored in the register and the analog input signal and for providing an output in accordance with said comparison;

means responsive to the comparison means for successively testing each less significant bit position of the register and changing the bit values of the bit positions as required so that the analog value of the n-bit digital representation substantially equals the analog input signal wherein the bits stored in the register are an n-bit digital representation of the analog input signals; and

means for subtracting a predetermined amount from the more significant bits prior to storing the more significant bits into the register wherein the amount subtracted is a function of the expected accuracy of the flash converter means.

4,641,130

ANALOG-TO-DIGITAL CONVERTER WITH SCALING OF INPUT SIGNAL

Anthony R. Mastroianni, Bridgewater Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

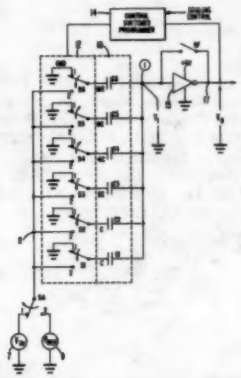
Filed Mar. 29, 1985, Ser. No. 717,827

Int. Cl.⁴ H03M *1/18*

U.S. Cl. 340—347 AD **11 Claims**

1. In a change-redistribution successive-approximation analog-to-digital (A/D) converter having a precision voltage reference (V_{REF}), in which said charge-redistribution portion of said converter includes a plurality of charge storing means, to which an unknown analog input voltage may be applied whose maximum rated value is greater than said precision reference voltage (V_{REF}), the improvement comprising:

control means including switching means coupled to said plurality of charge storing means for applying said unknown analog input voltage to selected ones of said plurality of charge storing means, during a sampling interval, and for subsequently redistributing the accumulated charge among a different number of said charge storing means for scaling the unknown analog input voltage by a factor approximately equal to the ratio of the value of the



precision reference voltage to the maximum rated value of the unknown analog input voltage.

4,641,131

CIRCUIT ARRANGEMENT FOR CONVERTING A DIGITAL INPUT SIGNAL INTO AN ANALOG OUTPUT SIGNAL

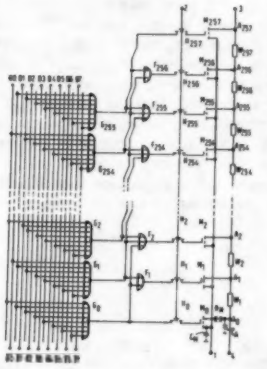
Walter H. Demmer, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 645,381, Aug. 29, 1984. This application Jun. 20, 1986, Ser. No. 878,409

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333067

Int. Cl.⁴ H03M *1/76*

U.S. Cl. 340—347 DA **8 Claims**



1. A circuit arrangement for converting a digital input signal into an analog output signal, comprising a voltage divider chain having ends, to which at least one reference source is connected, a plurality of taps arranged between the ends of said voltage divider chain, and means for connecting said taps, under control of said digital input signal, to an output at which said analog output signal is derived, characterized in that said connection means interconnects a predetermined number n of said taps, n being an integer greater than 1, and connects said interconnected taps to said output for each value of said digital input signal, whereby said analog output signal is the average

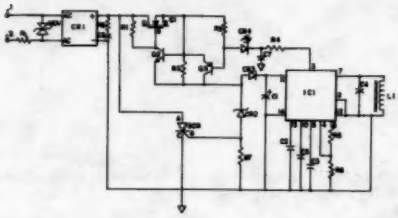
value of the voltages at the taps connected by said connecting means to said output.

4,641,132

CONDITION-RESPONSIVE SWITCHING CIRCUIT

Philip R. Reger, Newtown Square, Pa., assignor to American Manufacturing Company, Inc., King of Prussia, Pa.

Filed Sep. 20, 1984, Ser. No. 652,501
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—540 **6 Claims**



1. An electronic circuit for monitoring a predetermined condition and adapted to be used with a source of DC in series with a current-responsive load, comprising:

(a) a constant current source coupled to said DC source,

(b) output signal generating means adapted to be coupled to a means for detecting a change in said condition whereupon it produces a predetermined output signal,

(c) a first variable impedance means coupled to said constant current source and to a first output terminal of said signal generating means, said first variable means also being coupled to a first input terminal of said signal generating means,

(d) an electronic voltage breakdown device also coupled to said first variable impedance means,

(e) a resistive means in series with said breakdown device,

(f) a second variable impedance means disposed across said DC source and coupled to the junction of said breakdown device and said resistive means, said second variable impedance means normally being in one conductive state when said (b) means is not producing said predetermined output signal and in a second conductive state when said predetermined output signal is being produced whereupon it provides a very low impedance current path across said constant current source and said voltage breakdown device.

4,641,133

COMMUNICATION APPARATUS WHICH ALERTS OPERATOR TO PRESET AUTOMATIC OPERATION

Takeshi Ono, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,944
Claims priority, application Japan, Feb. 29, 1984, 59-36300
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—540 **22 Claims**

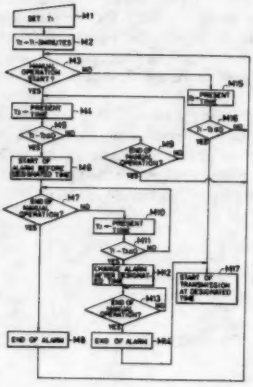
1. A communication apparatus comprising:

time setting means for setting a designated time;

automatic communication means for automatically communicating at said designated time;

detection means for detecting a manual operation by an operator; and

alarm means for issuing an alarm when said detection means detects a manual operation before said designated time



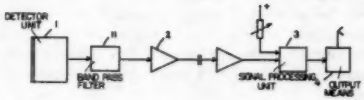
while said automatic communication means is in an automatic communication mode.

4,641,134

INFRARED-SENSITIVE DETECTOR CONSISTING OF PELTIER ELEMENT

Lars Stenmark, Klevbergsvägen 53, Stenhamra, Sweden

PCT No. PCT/SE84/00058, § 371 Date Sep. 17, 1984, § 102(e) Date Sep. 17, 1984, PCT Pub. No. WO84/03382, PCT Pub. Date Aug. 30, 1984
PCT Filed Feb. 17, 1984, Ser. No. 653,268
Claims priority, application Sweden, Feb. 18, 1983, 8300915
Int. Cl.[4] G08B 13/18
U.S. Cl. 340—567 **3 Claims**



1. A device for the detection of moving bodies which are warmer or cooler than the surroundings, comprising an infrared-sensitive detector connected to a preamplifier and a signal processing unit arranged to send electrical signals to an output means, wherein said detector consists of a Peltier element having a hot side and a cold side and a current supply terminal, one side of said Peltier element being placed in good thermal contact with a heat sink of high heat capacity and the other side being arranged to serve as the radiation-sensitive detector surface of the detector; and further characterized in that the current supply terminal of the Peltier element is connected to the input of a band-pass filter whose output is connected to the signal input of said preamplifier.

4,641,135

FIELD EFFECT DISPLAY SYSTEM WITH DIODE SELECTION OF PICTURE ELEMENTS

Johan O. Hilbrink, Cincinnati, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 27, 1983, Ser. No. 565,996
Int. Cl.[4] G09G 3/36
U.S. Cl. 340—784 **17 Claims**

1. A display system comprising:

a matrix of display means, each of said display means includ-

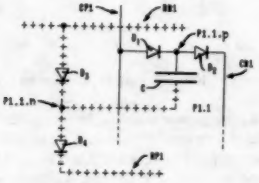
ing a field effect picture element having first and second inputs and a diode array selectively coupled to said first and second inputs;

means for selectively generating first and second address signals and a plurality of mode control signals during first and second modes of operation; and

diode decoding means selectively coupled to said matrix of display means and being responsive to said first and second address signals and to said plurality of mode control signals from said generating means for selectively enabling predetermined ones of said diode arrays to turn on associated ones of said picture elements in a first direction during said first mode of operation and in a second direction during said second mode of operation;

each of said field effect picture elements having first and second equivalent capacitor plates being connected, respectively, to the associated said first and second inputs;

said display system also including first and second substrates; and



each said diode array including first and second diodes coupled to the associated said first input and said diode decoding means and also including third and fourth diodes coupled to the associated said second input and said diode decoding means;

said first equivalent capacitor plates and said first and second diodes of each of said display means being located on said first substrate, and said second equivalent capacitor plate and the third and fourth diodes of each said display means being located on said second substrate so as to eliminate crossovers among said first and second inputs and diode array; and

said diode decoding means including first, second, third, and fourth pluralities of diode decoders coupled to said display means, with said first and third pluralities of diode decoders being located on said first substrate and with said second and fourth pluralities of diode decoders being located on said second substrate.

4,641,136

SECURITY EYES FOR PREVENTION OF CAR ACCIDENTS

Thaddeus Kowalczyk, 8163 Lochdale, Dearborn Heights, Mich. 48075

Continuation-in-part of Ser. No. 724,775, Apr. 18, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,318

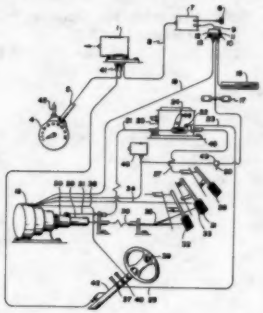
Int. Cl.[4] G08G *1/16, 1/00;* **B60D** *1/00*

U.S. Cl. 340—903 **10 Claims**

1. A collision avoidance system for an automobile or the like having a front wheel system, a braking system and a steering system, said system comprising:

means on the automobile for emitting a signal in the vicinity of the automobile, for receiving at least a portion of the emitted signal which is reflected from an object to be avoided and for generating a control signal having a magnitude proportional to the distance between the automobile and the object;

means for rotatably mounting said emitting means on said automobile; means for connecting said mounting means to the steering system of the automobile so that said emitting means rotates in synchronism with the turning of the steering system; and



control means responsive to said control signal for automatically actuating the braking system when the magnitude of said control signal is at least a first value.

4,641,137

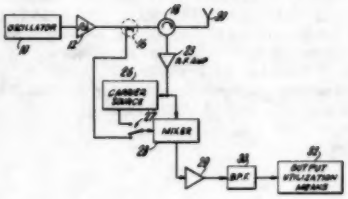
RADAR APPARATUS FOR DETERMINING RANGE TO AN AGITATED REFLECTIVE TARGET

Charles L. Opitz, Lancaster, Pa., and Paul E. Chase, Kendall Park, N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 6, 1975, Ser. No. 629,211

Int. Cl.[4] G01S *13/00, 13/52*

U.S. Cl. 342—52 **2 Claims**



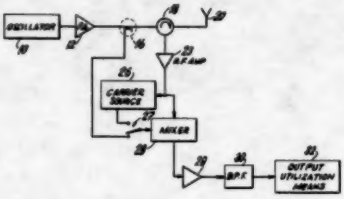
1. In combination in radar apparatus for detecting an agitated, reflective target comprising means for radiating an interrogation wave of radio frequency energy, means for receiving any reflected energy signal, mixing means for mixing said reflected signal with a local oscillation comprising a replica of the frequency of said radiated wave, band pass filter means connected to said mixing means for extracting from the output of said mixing means a band limited portion of said reflected signal in a fixed, predetermined frequency band adjacent to but not including the frequency after mixing of said radiated wave, and output utilization means connected to the output of said band pass filter means, wherein said output utilization means comprises elapsed time measuring means, means responsive to said extracted band limited signal from the output of said band pass filter means signalling the incidence of an agitated target for enabling said elapsed time measuring means, and means for deriving a measure of the signal generated by said elapsed time measuring means, wherein said elapsed time signal deriving means comprises audible responsive means responsive to an audible emission from the target for producing an output signal, and means responsive to said output signal from said audible responsive means for obtaining said measure of said signal provided by said elapsed time measuring means.

4,641,138

RADAR APPARATUS FOR DETECTING AN AGITATED REFLECTIVE TARGET

Charles L. Opitz, Lancaster, Pa., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 6, 1975, Ser. No. 629,226
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—61 **8 Claims**



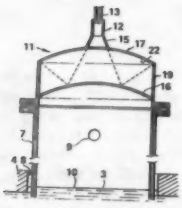
1. The method for detecting an agitated, reflective substantially stationary target comprising the steps of radiating an interrogation wave of radio frequency energy, receiving a reflected energy signal from the substantially stationary target, and mixing said received reflected signal with a local oscillation comprising a replica of the frequency of the radiated wave to extract a band limited portion of said reflected signal in a fixed, predetermined frequency band adjacent to and not including the frequency after mixing of said radiated wave and any Doppler frequency shifted reflected wave generated by relative motion between the interrogation wave emitting source and the target.

4,641,139

METHOD AND APPARATUS FOR MEASURING THE LEVEL OF A FLUENT MATERIAL IN A CONTAINER

Kurt O. Edvardsson, Linköping, Sweden, assignor to Saab Marine Electronics Aktiebolag, Gotzeborg, Sweden

Filed Apr. 22, 1985, Ser. No. 725,621
Claims priority, application Sweden, Apr. 25, 1984, 8402247
Int. Cl.[4] G01S *13/08*
U.S. Cl. 342—124 **10 Claims**



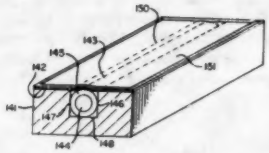
3. Apparatus for measuring the level of a fluent material in a container (1), comprising a tubular waveguide (7) that extends vertically downward through the container and is so communicated with it that said material has a surface in the waveguide which reflects microwave signals and which follows the level of the surrounding material in the container, and transmitting and receiving means (14) for generating a microwave signal, feeding it downward through said tubular waveguide and receiving it as reflected from said surface, said transmitting and receiving means cmprising an electronic unit for employing the received signal to determine the level of the material in the container, said apparatus being characterized by: said waveguide (7) having a diameter several times greater than the wavelength of said signal; and a mode generator (11) between said transmitting and receiving means (14) and said waveguide (7) that is arranged to produce substantially only one dominant propagation mode of the signal.

4,641,140

MINIATURIZED MICROWAVE TRANSMISSION LINK

Douglas E. Heckaman, Indialantic; Roger H. Higman, and Jeffrey A. Frisco, both of Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 26, 1983, Ser. No. 535,924
Int. Cl.[4] H01Q *3/22, 3/24, 3/26*
U.S. Cl. 342—371 **36 Claims**



27. A transmission line for use at microwave frequencies comprising:

a first layer of conductive material having a first surface in which a channel devoid of said material is formed;

an insulator-surrounded conductor disposed in said channel, the surrounding insulator of said insulator-surrounded conductor only partially occupying the available space in said channel external to said conductor;

a second layer of conductive material formed over said channel in which said insulator-surrounded conductor is disposed; and wherein

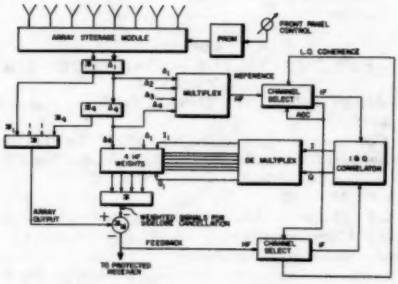
said channel has side walls whose depth is less than the outer diameter of said insulator-surrounded conductor.

4,641,141

COHERENT DUAL AUTOMATIC GAIN CONTROL SYSTEM

Raymond J. Masak, East Northport, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 2, 1984, Ser. No. 623,289
Int. Cl.[4] G01S *3/16*
U.S. Cl. 342—379 **1 Claim**



1. In a multiplexer/adaptive array processor having a reference channel selector implemented by a first receiver and a feedback channel selector implemented by a second receiver the improvement residing in a coherent dual automatic gain control system, said coherent dual automatic gain control system comprising:

a first gain control means controlling said first receiver, said

first gain control means effecting automatic gain control of said first receiver over its entire dynamic range,

a second gain control means controlling said second receiver being slaved to said first gain control means and setting the gain of said second receiver to the same value as the gain of said first receiver, and

a third gain control means controlling the output of said second receiver to maintain a constant level output thereof.

4,641,142

TACAN BEACON

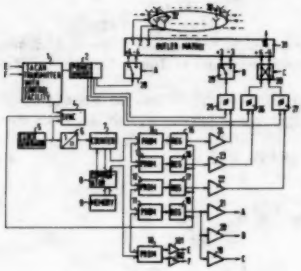
Gerhard Greving, Untergruppenbach; Günther Höfgen, Kornwestheim, and Rüdiger Zeltz, Ditzingen, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,598

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311569

Int. Cl.⁴ G01S *1/46*

U.S. Cl. 342—399 **7 Claims**



1. A TACAN beacon comprising:

an antenna consisting of a plurality of radiating elements distributed along a circle;

a transmitter arrangement including means for generating phase-modulated radio-frequency signals; and

means for feeding said phase-modulated radio-frequency signals to said radiating elements of said antenna causing the latter to radiate respective 15 Hz coarse bearing and 135 Hz fine bearing signals as respective upper and lower sidebands of a carrier signal, said means for feeding including

a power-distribution and phase-shift network interposed between said generating means and said radiating elements and operative for forming different radio-frequency phase-rotation fields at said antenna, and means for controlling the operation of said network in two alternating states, said upper and lower sidebands of said coarse-bearing signal being simultaneously transmitted in both states, and only the upper sideband of the fine bearing signal being transmitted in one of said two alternating states while only the lower sideband of the fine bearing signal is transmitted in another of said states, and the signs of the ordinal numbers of the different radio-frequency phase rotation fields of all of the radiated signals differing from one another in each of said two states.

4,641,143

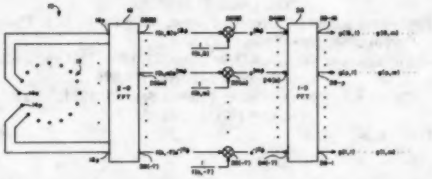
TWO-DIMENSIONAL ACQUISITION SYSTEM USING CIRCULAR ARRAY

John T. Apostolos, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 28, 1983, Ser. No. 536,477

Int. Cl.⁴ G01S *5/04, 3/16*; G06G *7/19*

U.S. Cl. 342—445 **4 Claims**



1. A method of finding the direction and frequency of a signal source whose signals are detected by a circular array of antenna elements, the method comprising the steps of:

A. generating the two-dimensional Fourier transform in time and space of the signal ensemble consisting of the outputs of the circular array, thereby generating components each of which is associated with a spatial frequency and a temporal frequency;

B. generating corrected components by applying to each component a correction function that differs only in the absence of the physical-angle-dependent phase factor from the inverse of the antenna pattern resulting when the antenna elements radiate signals whose temporal frequency is the temporal frequency associated with that component and whose phases advance with element position at the spatial frequency associated with that component; and

C. performing a spatial Fourier transformation on the resulting ensemble of corrected components, the radial direction of the source of a given portion of the transform thereby being indicated by the spatial frequency of that portion.

4,641,144

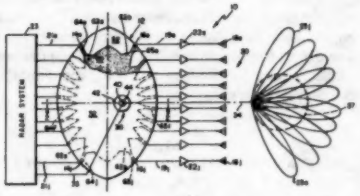
BROAD BEAMWIDTH LENS FEED

Robert J. Prickett, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 31, 1984, Ser. No. 687,679

Int. Cl.⁴ H01Q *15/04*

U.S. Cl. 343—754 **3 Claims**



1. A radio frequency antenna system comprising:

a radio frequency lens having a parallel plate region and having disposed along opposing peripheral portions thereof a plurality of array ports and a plurality of beam ports, such array ports being coupled to an array of antenna elements arranged to provide a plurality of differently, directed, relatively narrow collimated beams of radio frequency energy from a common aperture, each one of such beams being associated with a corresponding

one of the plurality of beam ports; and, means for coupling radio frequency energy directly into an interior portion of the parallel plate region to provide, from the common aperture, a relatively broad beam of radio frequency energy.

4,641,145

MICROWAVE ANTENNA HAVING AN ARRAY OF RADIATING ELEMENTS FOR CIRCULARLY POLARIZED SIGNALS

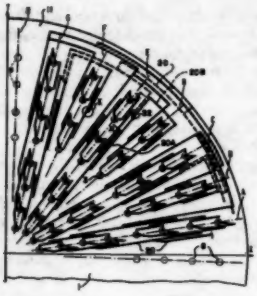
Emmanuel Rammos, Creteil, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 421,937, Sep. 23, 1982. This application Aug. 19, 1985, Ser. No. 767,684

Claims priority, application France, Sep. 23, 1981, 81 17915

Int. Cl.⁴ H01Q *1/38, 21/26*

U.S. Cl. 343—798 **3 Claims**



1. A flat microwave antenna comprising:

(a) a circular array of printed circuit elements each including first and second orthogonal dipoles separated by a dielectric, linear arrangements of said elements being positioned along respective radial lines of the antenna such that shorter arrangements are interposed between longer arrangements as the radial lines diverge sufficiently to provide adequate space for the shorter arrangements, and such that the density of elements in any sector of the circular array decreases with distance from a center of the array; and

(b) first and second printed circuit feedline networks electrically-connecting first and second supply terminals to the first and second dipoles of the elements, respectively, each of said networks extending inwardly from the array periphery between the elements and continuously branching out until one branch is provided for each element, the path length from any dipole along the connecting feedline network to the supply terminal for said dipole being substantially equal to that from any other dipole to its respective supply terminal.

4,641,146

DIPOLE ARRAY WITH PHASE AND AMPLITUDE CONTROL

John B. Gehman, La Jolla, Calif., assignor to General Dynamics Electronics Division, San Diego, Calif.

Division of Ser. No. 629,067, Jul. 9, 1984, Pat. No. 4,595,924, which is a continuation of Ser. No. 308,992, Oct. 6, 1981, abandoned. This application Apr. 8, 1985, Ser. No. 721,054

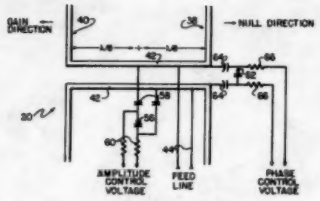
Int. Cl.⁴ H01Q *21/12, 21/22*

U.S. Cl. 343—814 **17 Claims**

1. A nulling antenna, which comprises:

a directive endfire-type array having two centerfed dipole elements, a length of parallel-conductor transmission line electrically-interconnecting the elements, and means for supporting the elements in substantially parallel spaced-apart relation;

two varactor devices electrically-connected across the transmission line, a first varactor device being connected approximately at midline and a second varactor device being connected approximately at an end of the line, including means for electrically isolating each of the



varactor devices from DC potential across the transmission line and for separately varying the DC potential across each varactor device in order to shunt the transmission line with selectively-variable values of reactance; and

a selective-variable feedpoint of the transmission line, including means for slidably adjusting the feedpoint to selected locations along the transmission line with a feedline electrically-connected thereto.

4,641,147

THERMAL PRINTER

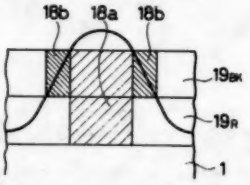
Yasuhiro Sakura; Hitoshi Nimura, and Mamoru Ishikawa, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,613

Claims priority, application Japan, Feb. 22, 1985, 60-33715

Int. Cl.⁴ G01D *15/10*

U.S. Cl. 346—76 PH **3 Claims**



1. A thermal printer comprising: recording papers each having multi-color-forming temperature characteristic; a thermal head containing a multiplicity of heating elements and capable of printing the recording paper over the entire width thereof while being kept in contact therewith during its unidirectional motion; at least two print buffers for feeding print data to control energization of the heating elements of said thermal head; and a current on-time control circuit for differentially setting the on-time periods of a constant current to the heating elements of said thermal head in response to selection of said print buffers under the predetermined condition that a basic color for general print data is formed at a low temperature while a different particular color for specific print data is formed at a high temperature in a printing operation on the recording paper by the heating elements of said thermal head, wherein a temperature gradient is induced relative to the thermal energy generated from said heating elements and transmitted to said recording paper when printing the specific characters in a high-temperature particular-color print mode, and the contours of said specific characters are treated at the low

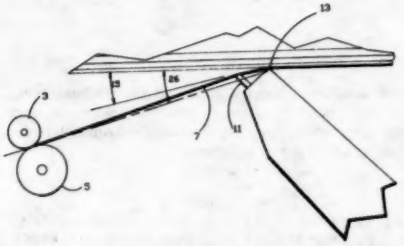
temperature for the basic color due to said temperature gradient so that each of the printed specific character is edged in the basic color.

4,641,148

THERMAL PRINTHEAD WITH RIBBON EXIT GUIDE

Stanley Dyer; James J. Molloy; Thoi Nguyen; David M. Riherd; William F. Voit, Jr., all of Lexington, and Donald L. West, Winchester, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,597
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 16 Claims



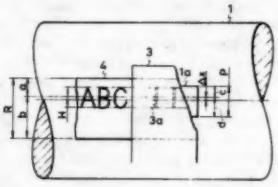
1. A thermal printhead having a set of print elements for printing from a ribbon when said elements are driven, a solid body supporting said print elements, and a wear-resistant ribbon guide member having at least one end integral with a surface for guiding said ribbon after said ribbon has been printed from by said print elements, said one end being embedded in and positioned by said solid body.

4,641,149

THERMAL TRANSFER PRINTER

Masafumi Suzaki, Hitachi; Katsumasa Mikami, Nakamachi; Yousuke Nagano, and Tomoji Kitagishi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,319
Claims priority, application Japan, Aug. 29, 1984, 59-178351
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 8 Claims



1. A thermal transfer printer comprising a thermal head, a platen roller being pressed against said thermal head through a thermal transfer printing paper, a carriage mounted with said thermal head and a ribbon cassette and transversely moving along said platen roller, and an ink ribbon having plural columns and being received within said ribbon cassette characterized in that

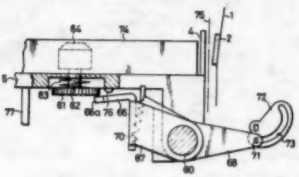
a center of a flat portion being formed on said platen roller of a contact portion of said thermal head and a center of said thermal head are shifted corresponding to an amount of a shift of printing position as against a center of a width of said ink ribbon.

4,641,150

THERMAL PRINTER

Takanobu Matsuura, Takizawa, and Toshiyuki Yamamoto, Tamayama, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 31, 1985, Ser. No. 793,685
Claims priority, application Japan, Oct. 31, 1984, 59-163748[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 3 Claims



1. In a thermal printer of the type comprising a platen extending longitudinally for supporting a recording paper thereon, a carriage supporting a print head which is reciprocally movable longitudinally along said platen and angularly movable toward said platen for printing and away from said platen for non-printing, said carriage including means for holding a print tape thereon and means including a gear rotatably mounted on said carriage for winding the print tape, a winding rack disposed longitudinally parallel to said platen and having a plurality of teeth arrayed along a printing length thereof, said rack being movable such that its teeth are brought into engagement with said winding gear for winding the print tape for printing and brought out of engagement from said winding gear in order not to wind the print tape during non-printing, and driving means for moving said carriage toward the platen and said rack teeth into engagement with said winding gear for printing and for moving said carriage away from the platen and said rack teeth out of engagement from said winding gear for non-printing,

the improvement wherein said driving means comprises said rack having said teeth arrayed on a plate extending longitudinally parrallel to said platen and one end of said plate fixed to a lever pivotably mounted at one end of said platen, and pivoting means at said end of said platen for pivoting said lever to bring said plate into or out of contact with a portion of said carriage so as to angularly move it and said print head supported thereon toward and away from said platen and at the same time to bring said rack teeth into and out of engagement with said winding gear on said carriage.

4,641,151

THERMAL TRANSFER RECORDING APPARATUS

Shigeru Kato; Naomi Osada, both of Yokohama; Toshikatsu Ichitoh, Kawasaki; Masae Murata, Yamato, and Masfumi Mochizuki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

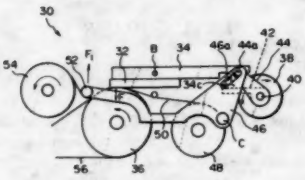
Filed Dec. 26, 1985, Ser. No. 813,440
Claims priority, application Japan, Dec. 28, 1984, 59-274566; Dec. 28, 1984, 59-196618[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH 7 Claims

1. A thermal transfer recording apparatus for recording information on a recording sheet by means of an ink sheet which is interposed between the recording sheet wrapped around a platen roller and a thermal head, comprising:

a head support plate carrying the thermal head at one end portion thereof and pivotally movable in a seesaw motion about a fulcrum which is located between said one end portion and another end portion of said head support plate;

a rotary solenoid device for generating a drive force;

a first pressing means for pressing the thermal head against the platen roller by transmitting the drive force generated by said rotary solenoid device to the head support plate to move the head support plate about the fulcrum; and



second pressing means subjected to the tension of the ink sheet during recording for intensifying the pressing force of the head against the platen by transmitting an additional drive force, which is related to the tension of the ink sheet, to the head support plate via the first pressing means.

4,641,152

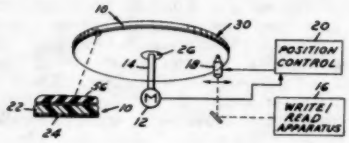
FIXTURING APPARATUS FOR VIBRATION DAMPENED OPTICAL DISC RECORDING

Stephen C. Fedder, Oak Park, and Anthony J. Skudrna, Harsens Island, both of Mich., assignors to Producers Color Service, Inc., Southfield, Mich.

Filed Feb. 24, 1986, Ser. No. 831,828

Int. Cl.[4] G01D *15/34*; G11B *7/24*

U.S. Cl. 346—137 **12 Claims**



11. Apparatus for mounting an optical recording disc to a drive spindle, said apparatus comprising a hub having a conical disc-locating surface defining a hub axis and a planar axially facing shoulder spaced radially from said locating surface for seating engagement with a recording disc received over said locating surface; a plate mounted on said hub and extending radially to a plate periphery; a retaining ring removably mounted at said plate periphery, said ring cooperating with said plate and hub to form an annular channel between said hub shoulder and said ring; and a disc of resilient elastomeric construction positioned in said channel and having a flat axially facing surface remote from said plate and disposed between said shoulder and said plate; said retaining ring having a radially inwardly projecting lip for overlapping and capturing the peripheral edge of a recording disc mounted on said hub and seated against said hub shoulder.

4,641,153

NOTCHED PIEZO-ELECTRIC TRANSDUCER FOR AN INK JET DEVICE

Antonio S. Cruz-Uribe, Cobalt, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 3, 1985, Ser. No. 772,109

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **7 Claims**

1. Ink ejecting portion of an ink jet print head, comprising:

a plate;

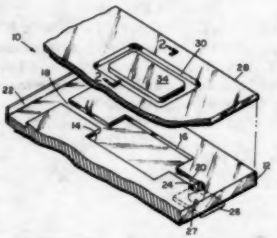
a cavity in said plate;

a first channel in said plate extending from said said cavity;

a manifold confluent with said first channel;

a second channel in said plate extending from said cavity;

an opening in said plate confluent with said second channel; and



a piezoceramic sheet disposed upon said plate and extending over said cavity to form a chamber therewith, said piezoceramic sheet having a notched configuration in the vicinity of the walls of said cavity.

4,641,154

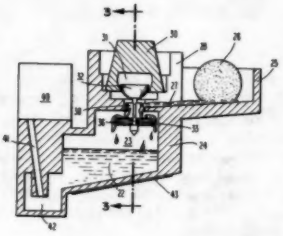
INK JET APPARATUS WITH RESERVOIR HAVING A TILT VALVE SERVING AS FILL PORT AND AIR VENT

Arthur Mikalsen, Carmel, N.Y., assignor to Exxon Printing Systems, Inc., Brookfield, Conn.

Filed Nov. 2, 1984, Ser. No. 667,903

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **12 Claims**



1. An ink jet type apparatus having a reservoir, receiving means for receiving a hot melt ink pellet and for melting same, inlet means positioned above said reservoir and in communication with said receiving means and said reservoir for introducing melted ink into said reservoir, ink jet head means in communication with said reservoir for producing ink jet droplets, said inlet means comprising a tilt valve having a normally open position for venting air from said reservoir and providing a fill port for passage of ink into said reservoir, and having a closed position when said reservoir is tilted more than a predetermined angle, and priming means for priming said reservoir and print head, said priming means having displacing means for displacing said tilt valve to said closed position.

4,641,155

PRINTING HEAD FOR INK JET PRINTER

Steven I. Zoltan, Brookfield, Conn., assignor to Advanced Color Technology Inc, Chelmsford, Mass.

Filed Aug. 2, 1985, Ser. No. 761,860

Int. Cl.[4] G01D *15/18*

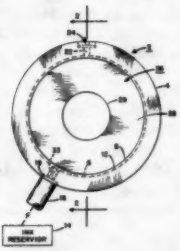
U.S. Cl. 346—140 R **16 Claims**

1. An ink jet printer head system comprising

a printer head having

a housing having therein an annular channel,

an annular diaphragm secured to said housing and forming with said channel an annular ink reservoir,
said housing including an inlet port and an outlet orifice each communicating with said reservoir, and
a piezoelectric transducer comprising



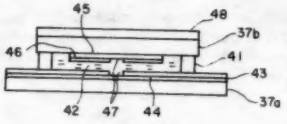
piezoelectric material having an annular surface in mechanical engagement with said diaphragm, and
first and second electrodes on opposite sides of said piezoelectric material.

4,641,156

RECORDING APPARATUS WITH DOUBLE FREQUENCY DRIVEN LIQUID CRYSTAL SHUTTER

Morio Ohta; Shizuo Tsuchiya; Yoshito Nakano; Masaru Aikawa, and Seiji Asaumi, all of Musashimurayamashi, Japan, assignors to Casio Computer Co., Ltd. and Casio Electronics Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,521
Claims priority, application Japan, Dec. 30, 1983, 58-249054; Jan. 23, 1984, 59-8607; May 31, 1984, 59-111955
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 **10 Claims**



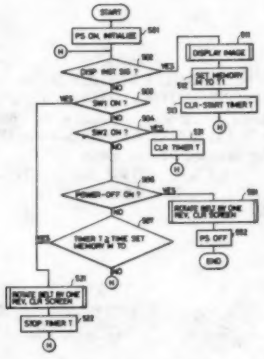
1. Recording apparatus for optically writing on a photoreceptor in correspondence with image signals to be recorded comprising:
(a) a light source for producing light;
(b) a liquid crystal shutter for selectively transmitting light from said source;
(c) means for focusing light transmitted by said liquid crystal shutter onto the photoreceptor;
(d) said liquid crystal shutter being composed of a first transparent substrate provided with n-units of write selecting electrodes, a second transparent substrate provided with a plurality of recording signal electrodes which cross and are opposite the n-units of the write selecting electrodes, and a liquid crystal agent sealed between both substrates and whose dielectric anisotrophy becomes zero at a specified frequency f_C, said write selecting and recording signal electrodes being provided with micro-shutters at the crossings therebetween;
(e) a first supply means for supplying to the n units of the write selecting electrodes, write selecting signals having a frequency f_H higher than said specified frequency f_C, and a frequency f_L lower than said specified frequency f_C such that the phase of successive write selecting signals reverses after a time period Tw/n which is 1/n of the write cycle time Tw; and
(f) a second supply means, responsive to said image signals, for supplying to the recording signal electrodes, recording signals of frequencies f_H and f_L having amplitudes that are the same as the amplitudes of said write selecting signals;
(g) said first and second supply means being constructed and arranged such that during a selection period, in which a micro-shutter is selected by the write selecting signals, superposed driver signals are applied to the selected micro-shutter, said driver signals having either (i) the frequencies f_L and F_H throughout the selection period, or (ii) the frequency f_H near the start of a selection period and of the frequencies f_L and f_H near the end of a selection period for establishing the on-off state of the selected micro-shutter; (h) said first and second supply means being further constructed and arranged such that, during a non-selection period in which a micro-shutter is not selected by the write selecting signals, said driver signals applied to a non-selected micro-shutter have the frequency f_L near the end of a non-selection period and either (i) the frequencies f_L and f_H near the beginning of of a non-selection period, or (ii) no frequency near the beginning of a non-selection period for establishing the on-off state of the non-selected micro-shutter during a preceeding selection period.

4,641,157

IMAGE DISPLAY DEVICE

Shigeru Aoi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,839
Claims priority, application Japan, Dec. 20, 1982, 57-222123; Dec. 20, 1982, 57-222124; Dec. 20, 1982, 57-222125
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 **10 Claims**

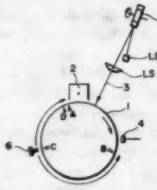


1. An image display device comprising:
a display section for displaying an image;
image forming means having an image carrier, for forming an image on said image carrier so as to display the image on said display section; and
control means for controlling said image forming means,
wherein said control means has a non-image area display means for automatically displaying a non-image area at said display section when the same image formed on said image carrier is displayed on said display section over a predetermined period of time.

4,641,158
ELECTROPHOTOGRAPHIC APPARATUS

Akihiko Takeuchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,185
Claims priority, application Japan, Feb. 13, 1984, 59-24760; Feb. 13, 1984, 59-24761; Feb. 13, 1984, 59-24762
Int. Cl.[4] G01D 15/14
U.S. Cl. 346—160 26 Claims



1. An electrophotographic apparatus, comprising:

an electrophotographic photosensitive member including as a main component amorphous silicon, the photosensitive member being circularly movable by a first station, a second station and a third station repetitively in the order named;

charging means, provided at the first station, for charging said photosensitive member;

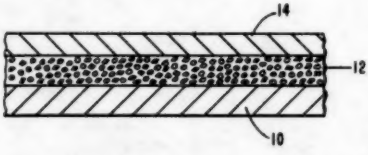
first exposure means, provided at the second station, for exposing said photosensitive member to a semiconductor laser beam of wavelength longer than 700 nm, which is modulated in accordance with information to be recorded on the photosensitive member; and

a second exposure means, provided at the third station, for exposing said photosensitive member to light having a peak of a spectral distribution at a wavelength longer than 600 nm.

4,641,159
PROTECTIVE BARRIER AND METHOD OF PROVIDING SAME FOR THERMOSENSITIVE SHEET

Paul W. Seitz, Miamisburg; Maurice W. Lewis, Dayton, and Stephen D. Lakes, West Carrollton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 18, 1985, Ser. No. 724,381
Int. Cl.[4] B41M 5/18
U.S. Cl. 346—200 2 Claims



1. A thermosensitive sheet comprising a substrate, a

thermally reactive coating on the substrate, the thermally reactive coating comprising a color forming dye, a wax, a bisphenol, and a binder, and a

protective layer on the thermally reactive coating, the protective layer being capacitor tissue of a thickness to enable heat transfer therethrough for forming thermal images, and of translucent material to permit viewing of the thermal images.

4,641,160
RECORDING SYSTEM UTILIZING PHTHALIDE DERIVATIVES AS COLORLESS CHROMOGENIC MATERIAL

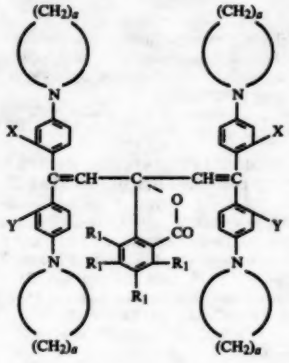
Mitsuru Kondo; Tomoyuki Okimoto, both of Hyogo, and Nobuo Kanda, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 366,338, Apr. 7, 1982, abandoned. This application Nov. 2, 1984, Ser. No. 667,805
Claims priority, application Japan, Apr. 8, 1981, 56-53678
Int. Cl.[4] B41M 5/18
U.S. Cl. 346—220 1 Claim

1. A heat-sensitive record material which comprises:

(a) a heat-sensitive recording layer including a colorless chromogenic material; and

(b) an electron accepting acidic reactant material on a base sheet, said colorless chromogenic material being at least one phthalide compound having the formula:

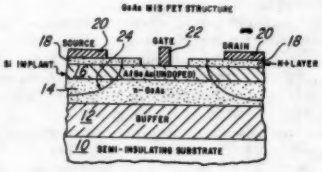


wherein R_1 is chlorine or bromine; each X and Y is hydrogen, alkyl having 1 or 2 carbon atoms, or alkoxyl having 1 or 2 carbon atoms; and a is an integer of 4 to 6, but when both X and Y are hydrogen, a is 6.

4,641,161
HETEROJUNCTION DEVICE

Bumman Kim, Richardson, and Hua Q. Tserng, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1984, Ser. No. 656,110
Int. Cl.[4] H01L 29/80
U.S. Cl. 357—22 16 Claims



3. A heterojunction device comprising:

a channel layer comprising a first semiconductor material and comprising a dopant concentration of at least ten to the 16th per cubic centimeter;

a barrier layer overlying said channel layer and comprising a second semiconductor material attice-matched to said first material and having a bandgap wider than the bandgap of said first semiconductor material and comprising a

net dopant concentration less than ten to the 16th per cubic centimeter;

first and second source/drain contacts electrically connected to said channel layer, and a gate electrode abutting said barrier layer and capacitatively coupled to a portion of said channel layer between said source/drain connections.

4,641,162

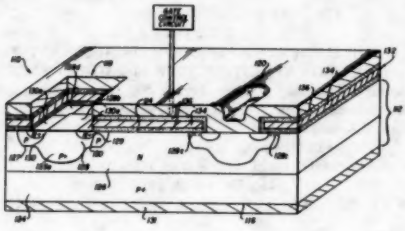
CURRENT LIMITED INSULATED GATE DEVICE

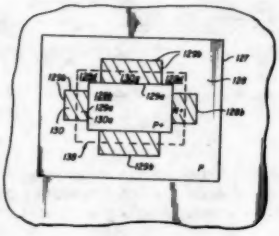
Hamza Yilmaz, Dewitt, N.Y., assignor to General Electric Company, Research Triangle Park, N.C.

Filed Dec. 11, 1985, Ser. No. 807,597

Int. Cl.⁴ H01L *29/06*

U.S. Cl. 357—23.4 **15 Claims**





1. A semiconductor device comprising:

a semiconductor wafer having a drift region of a first conductivity type, said drift region including a major surface;

an insulating region including at least one contact window exposing an area of said major surface;

a gate electrode separated from said major surface by said insulating region;

a cell centrally aligned with said contact window and extending beyond the boundaries thereof, said cell including a base region of a second conductivity type extending from said major surface into said drift region and including a central base portion;

said cell further including a plurality of mutually spaced emitter regions of said first conductivity type disposed about said central base portion and adjacent thereto, each of said emitter regions extending from said major surface into said base region and forming a separate emitter-base junction therewith;

said major surface area exposed by said contact window including a surface of said central base portion, and further including surface portions of said mutually spaced emitter regions and of said base region intermediate said emitter regions respectively adjoining said central base portion surface;

an emitter electrode insulated from said gate electrode and disposed in ohmic contact with said exposed major surface area; and

means for applying a bias voltage to said gate electrode to establish a separate channel in said base region adjacent said major surface between each of said emitter regions and said drift region;

whereby said separate emitter-base junctions effect a reduction of the gate periphery of said cell by an amount selected to maintain the maximum current flow from said channels to said emitter regions below the latch-up current level of said cell.

4,641,163

MIS-FIELD EFFECT TRANSISTOR WITH CHARGE CARRIER INJECTION

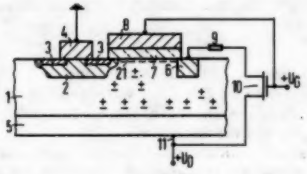
Jenö Tihanyi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 10, 1983, Ser. No. 456,613

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1982, 3200660

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **11 Claims**



1. MIS-FET assembly, comprising a first MIS-FET having a semiconductor substrate of a first conductivity type with first and second surface, at least one channel zone of a second conductivity type opposite said first conductivity type being embedded in said first surface of said substrate, a source zone of said first conductivity type being embedded in said channel zone, a drain zone adjoining said first surface of said substrate, a drain electrode connected to said second surface of said substrate, an insulting layer disposed on said first surface of said substrate, at least one gate electrode disposed on said insulating layer, and at least one injector zone of said second conductivity type being embedded in said first surface of said substrate defining a pn-junction between said injector zone and said drain zone being disposed under said at least one gate electrode, said gate electrode extending at least to the part of the pn-junction of said injector zone which emerges to the first substrate surface between the injector zone and the drain zone, and a second MIS-FET having a gate electrode and having a source and drain electrodes defining a source-drain path being connected between said injector zone of said first MIS-FET and said drain zone of said first MIS-FET, said gate electrode of said second MIS-FET being electrically connected to said at least one gate electrode of said first MIS-FET.

4,641,164

BIDIRECTIONAL VERTICAL POWER MOS DEVICE AND FABRICATION METHOD

Gary M. Dolny, Middletown Township, Bucks County, Pa., and Lawrence A. Goodman, Plainsboro, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 30, 1986, Ser. No. 868,633

Int. Cl.⁴ H01L *29/78, 29/08, 29/44*

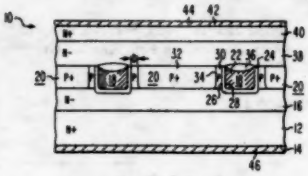
U.S. Cl. 357—23.4 **3 Claims**

1. In a vertical MOSFET device including a silicon wafer having first and second opposing major surfaces, a source electrode disposed on the first surface, a drain electrode disposed on the second surface and an internally disposed insulated gate comprising a conductive electrode surrounded by a gate insulator, the silicon disposed between the insulated gate and each of the major surfaces being monocrystalline and of

first conductivity type and the silicon disposed laterally adjacent to the insulated gate being monocrystalline and of second conductivity type, such that a predetermined voltage applied to the insulated gate creates an inversion channel for a predetermined distance in the laterally adjacent silicon, the improvement comprising:

a relatively lightly doped region disposed in that portion of the laterally adjacent silicon where the inversion channel is formed and relatively heavy doping in other areas of the laterally adjacent silicon;

a relatively lightly doped first voltage-supporting region disposed in that portion of the silicon that is contiguous with the insulated gate and is between both the insulated



gate and the first wafer surface and the laterally adjacent silicon and the first wafer surface and a relatively heavily doped silicon region between the first voltage-supporting region and the first surface;

a relatively lightly doped second voltage-supporting region disposed in that portion of the silicon that is contiguous with the insulated gate and is between both the insulated gate and the second wafer surface and the laterally adjacent silicon and the first wafer surface and a relatively heavily doped silicon region between the second voltage-supporting region and the second surface; and

an interface between the gate insulator and the laterally adjacent silicon that has a low density of interface states.

4,641,165

DYNAMIC MEMORY DEVICE WITH AN RC CIRCUIT FOR INHIBITING THE EFFECTS OF ALPHA PARTICLE RADIATION

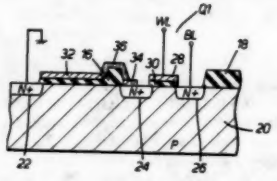
Tetsuya Iizuka; Syuso Fujii, both of Kawasaki, and Yukimasa Uchida, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 15, 1983, Ser. No. 475,554

Claims priority, application Japan, Apr. 28, 1982, 57-70403; May 21, 1982, 57-85742; May 21, 1982, 57-85743; May 21, 1982, 57-85744

Int. Cl.⁴ H01L *27/14*

U.S. Cl. 357—23.6 **20 Claims**



1. A dynamic memory device formed in an integrated semiconductor substrate and subjected to particle radiation comprising:

a switching transistor having a switching terminal, an input-output terminal and a memory terminal;

a bit line coupled to said input-output terminal for supplying a charge to said transistor;

a word line coupled to said switching terminal for controlling the switching of said transistor;

a resistance-capacitance circuit means, coupled to said memory terminal and comprising a resistor and a charge store capacitor and having a time constant which is greater than the funnelling time constant of the particle radiation, for storing the charge supplied from said bit line and for substantially preventing loss of the stored charge due to said particle radiation; and

a potential reference coupled to said resistance-capacitance circuit means.

4,641,166

SEMICONDUCTOR MEMORY DEVICE HAVING STACKED CAPACITOR-TYPE MEMORY CELLS

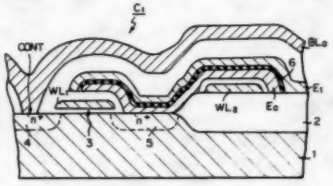
Yoshihiro Takemae, Tokyo; Tomio Nakano, Kawasaki, and Kimiaki Sato, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 12, 1983, Ser. No. 560,171

Claims priority, application Japan, Dec. 20, 1982, 57-222079

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.6 **10 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate of a first conductivity type;

a plurality of word lines extending in parallel over said substrate;

a plurality of sense amplifiers;

a plurality of pairs of bit lines extending over said substrate transversely to said word lines, each said pair of bit lines being connected to corresponding inputs of a corresponding one of said sense amplifiers, and both of the bit lines of each said pair intersecting each of said word lines; and

stacked capacitor-type memory cells, each formed in the vicinity of an intersection between a corresponding one of said word lines and a corresponding one of said pairs of said bit lines,

wherein each of said memory cells comprises:

first and second impurity doped regions of a second conductivity type opposite to said first conductivity type formed in said substrate, each said first impurity doped region being electrically connected to a respective one of said bit lines, said first and second impurity doped regions and a respective portion of said corresponding one of said word lines forming a transfer transistor;

a first conductive layer electrically connected to said second impurity doped region, for forming a first of two capacitor electrodes, said first conductive layer extending over a respective part of another one of said word lines adjacent to said «orresponding word line;

an insulating layer disposed on said first conductive layer; and

a second conductive layer, disposed on said insulating layer, for forming the second of said two capacitor electrodes.

4,641,167

SEMICONDUCTOR OPTOELECTRO TRANSDUCER

Jun-chi Nishizawa, Sendai, Japan, assignor to Semiconductor Research Foundation, Japan

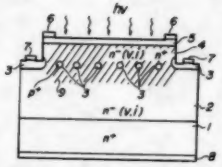
PCT No. PCT/JP82/00458, § 371 Date Jul. 29, 1983, § 102(e) Date Jul. 29, 1983, PCT Pub. No. WO83/02038, PCT Pub. Date Jun. 9, 1983

PCT Filed Nov. 30, 1982, Ser. No. 522,153

Claims priority, application Japan, Dec. 1, 1981, 56-194286

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 9 Claims



1. A semiconductor optoelectric transducer comprising:

an intrinsic semiconductor material layer of one conductivity type having a channel region which is doped with an element that is excited by infrared light, said element being selected from the group consisting of gold, mercury and zinc; two main electrode regions connected to said semiconductor layer adjacent said channel region for supplying a flow of current through the channel region; a plurality of gate regions communicating with said channel region without closing communication through said channel region between said two main electrode regions; and a portion of said channel region being shaped for receiving infrared light for exciting the element doped into the channel region.

4,641,168

LIGHT SENSITIVE SEMICONDUCTOR DEVICE FOR HOLDING ELECTRICAL CHARGE THEREIN

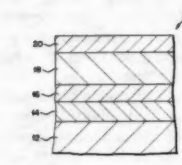
Mutsuki Yamazaki, and Eiichi Kaga, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

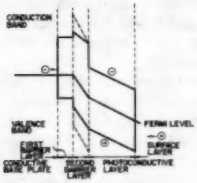
Filed Nov. 2, 1983, Ser. No. 547,921

Claims priority, application Japan, Jan. 26, 1983, 58-11933; Apr. 6, 1983, 58-61324; Apr. 6, 1983, 58-61325; Apr. 6, 1983, 58-61326; Jul. 19, 1983, 58-130218

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 17 Claims





1. A light sensitive semiconductor device, comprising:

a photoconductive layer means for generating carriers which carry an electric charge when said photoconductive layer is irradiated with light;

a conductive base member supporting said photoconductive layer;

first barrier layer means, provided between said photoconductive layer and said conductive base member, for hindering the movement of an electric charge from said conductive base member to said photoconductive layer, and for permitting the movement of an electric charge from said photoconductive layer to said conductive base member, said first barrier layer means comprising an extrinsic semiconductor; and

a second barrier layer means, provided between said photoconductive layer and said first barrier layer means for hindering the movement of an electric charge from said conductive base member to said photoconductive layer, and for permitting the movement of an electric charge from said photoconductive layer to said conductive base member, said second barrier layer comprising an extrinsic semiconductor;

said hindering and permitting by said first and second barrier layer means thereby causing the residual potential of said photoconductive layer to be minimized.

4,641,169

SOLID-STATE IMAGE PICKUP DEVICE WITH SELECTIVE OUTPUT CHARACTERISTICS AND IMAGING APPARATUS USING SAME

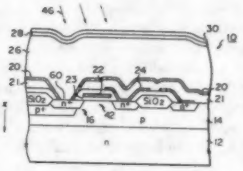
Masafumi Inuiya, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 2, 1985, Ser. No. 688,202

Claims priority, application Japan, Jan. 19, 1984, 59-6354

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 9 Claims



1. A solid-state image pickup device comprising:

a semiconductor substrate;

an array of a plurality of photosensitive cells formed on the semiconductor substrate;

reading means formed on said substrate for selectively reading said plurality of photosensitive cells to produce video signals associated with light incident to the array;

each of said photosensitive cells including,

a junction portion formed on said substrate for storing therein photocarriers,

a layer of metal formed over said substrate and interconnected to said junction portion to collect photocarriers to said junction portion, said layer of metal having an optical opening over at least part of said junction portion to allow incident light access thereto,

a layer of photoconductive material formed on said metal layer to generate therein photocarriers associated with the incident light, and

a layer of electrically conductive material formed on said photoconductive layer to form an electrode for receiving a bias voltage, said electrically conductive material being substantially transparent with respect to the incident light; and

means for varying the value or polarity of said bias voltage to adjust the output characteristics of said video signal.

4,641,170

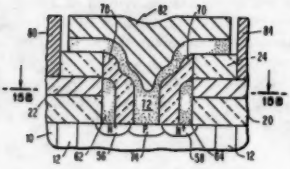
SELF-ALIGNED LATERAL BIPOLAR TRANSISTORS

Seiki Ogura, Hopewell Junction; Jacob Riseman, Poughkeepsie; Nivo Rovedo, Poughquag, and Joseph F. Shepard, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation

Division of Ser. No. 560,629, Dec. 12, 1983, Pat. No. 4,551,906. This application Aug. 5, 1985, Ser. No. 762,669

Int. Cl.[4] H01L 29/72

U.S. Cl. 357—35 8 Claims



1. An integrated circuit structure which includes small area lateral bipolar transistors comprising:

a semiconductor body having surface regions thereof isolated from other such regions by a pattern of isolation;

at least two narrow width PN junction regions within at least one of said surface regions;

individual substantially vertical conformal conductive layers, each one being essentially rectangular in vertical cross-section with two long edges, and with two short edges equal in width to the vertical conductive layer thickness, said individual vertical conductive layers making electrical contact to said PN junction regions only with one of said two short edges, and with no other electrical contact being made to said PN junction regions other than through another PN junction region;

said at least two PN junction regions form the emitter and collector regions of one of said lateral bipolar transistors;

a base PN junction region between and contiguous to said emitter and collector regions;

a substantially horizontal conductive layer in electrical contact with an edge of each of said vertical conductive layers and separated from said emitter and collector regions by a first electrical insulating layer;

a second insulating layer covering said conformal conductive layers and in contact with said emitter and collector regions;

said horizontal conductive layer is patterned so as to have electrically separated conductive lines from one another;

a third electrical insulating layer over said patterned horizontal conductive layer;

an electrical ohmic contact to each of the patterned portions of said horizontal conductive layer through an opening in said third electrical insulating layer which effectively makes electrical contact to said emitter and collector regions through said patterned horizontal conductive layer and said vertical conductive layer; and

an electrical ohmic contact to said base region which contact is separated from said vertical conductive layers by said second insulating layer.

4,641,171

MONOLITHICALLY INTEGRATED SEMICONDUCTOR POWER DEVICE

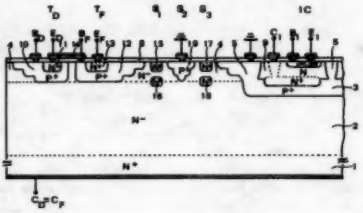
Franco Bertotti, Milan; Giuseppe Ferla, Catania; Salvatore Musumeci, Riposto, and Salvatore Raciti, Belpasso, all of Italy, assignors to SGS Microelectronica SpA, Agrate Brianza, Italy

Filed Sep. 17, 1985, Ser. No. 776,961

Claims priority, application Italy, Sep. 21, 1984, 6620 A/84

Int. Cl.[4] H01L 27/02

U.S. Cl. 357—46 20 Claims



1. A monolithically integrated semiconductor power device structure, comprising at least two power transistors and an integrated control circuit which are integrated monolithically in the same chip, comprising:

a substrate of semiconductor material of a first type of conductivity bounded by an upper surface partially covered by an insulating layer and forming collector regions of said at least two power transistors;

at least three regions of semiconductor material of a second type of conductivity opposite to said first type of conductivity and formed in said substrate from said upper surface below said insulating layer so as to form P-N junctions, a first of said three regions forming an isolation region of said integrated circuit which contains devices of said control circuit of said semiconductor power device, and a second region and a third region forming base regions of said power transistors;

at least a fourth and fifth region of semiconductor material of said first type of conductivity forming emitter regions of said power transistors and formed from said upper surface below said insulating layer in said second and third regions respectively so as to form P-N junctions;

a conductive means which establish ohmic contacts with said substrate and said base and emitter regions of said power transistors;

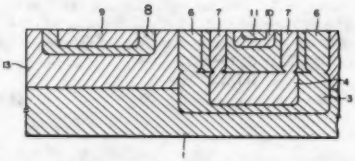
wherein said two power transistors are connected in a Darlington pair configuration comprising a drive transistor and an output transistor, said output transistor of said Darlington pair being disposed in an intermediate position between said drive transistor of said Darlington pair and said integrated control circuit such that said drive transistor and said control circuit are not in mutual contact and said output transistor completely shields said drive transistor from said control circuit.

4,641,172

BURIED PN JUNCTION ISOLATION REGIONS FOR HIGH POWER SEMICONDUCTOR DEVICES

Shiro Iwatani, Aioi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00339, § 371 Date Apr. 28, 1982, § 102(e) Date Apr. 28, 1982, PCT Pub. No. WO84/01053, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 26, 1982, Ser. No. 493,137
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.⁴ H01L 21/76, 29/70
U.S. Cl. 357—48 2 Claims



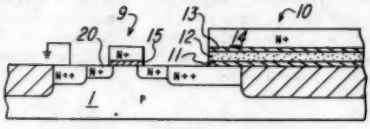
1. A semiconductor device having a plurality of circuit elements comrpising:
- a first substrate layer of a first conductivity type and a low resistance;
- a second substrate layer of said first conductivity type and a high resistance containing at least one of said plurality of circuit elements;
- a region of said first conductivity type and a high resistance containing at least one of said plurality of circuit elements, said region being isolated from said first and second substrate layers by an enclosed wall comprising a buried portion of a second conductivity type arranged so as to bridge said first and second substrate layers and another portion contiguous with said buried portion and of said second conductivity type, said another portion being wholly within said second substrate layer.

4,641,173

INTEGRATED CIRCUIT LOAD DEVICE

Satwinder Malhi, Garland, and David A. Baglee, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 20, 1985, Ser. No. 799,890
Int. Cl.⁴ H01L 27/12, 49/02, 29/78, 27/02
U.S. Cl. 357—51 21 Claims



1. A resistive load device comprising:
- a first layer of conductive material serving as one terminal of said load device;
- a first layer of insulating material capable of tunneling electrons directly overlying said first layer of conductive material;
- a layer of resistive material overlying said first insulating layer;
- a second layer of insulating material overlying said resistive material;
- a second layer of conductive material overlying said second layer of insulating material, said second layer of conductive material being connected to serve as another terminal of said resistive load device;

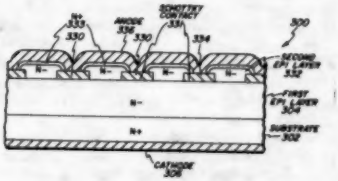
wherein, at voltages above the tunneling threshold of said first layer of insulating material, the resistance of said layer of resistive material dominates the resistance of said first layer of insulating material.

4,641,174

PINCH RECTIFIER

Bantval J. Baliga, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1983, Ser. No. 510,520
Int. Cl.⁴ H01L 29/12
U.S. Cl. 357—58 15 Claims



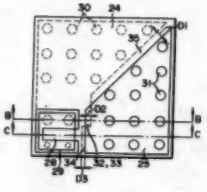
11. A pinch rectifier comprising:
- a body of semiconductor of one type conductivity material having first and second surfaces;
- a first electrode ohmically contacting said body on said first surface;
- a plurality of discrete metal electrode portions disposed in spaced relation on said second surface and making Schottky barrier engagement therewith;
- said body further including an epitaxial layer of one type conductivity disposed on and making ohmic contact with said second surface of said semiconductor body and being contiguous with and making Schottky contact with said plurality of discrete metal electrode portions; and
- a second electrode ohmically contacting said epitaxial layer and said plurality of discrete metal electrode portions;
- said plurality of discrete metal electrode portions defining channel regions therebetween in said body such that under zero or reverse bias conditions, depletion regions formed by said metal electrode portions extend throughout each of said channel regions to block current flow through said channel regions.

4,641,175

BIDIRECTIONAL POWER SWITCH WITH OPTIMIZED EMITTER SPACING NEAR CONTROL ELECTRODE

Takashi Shiraishi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 568,914, Jan. 6, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 851,893
Claims priority, application Japan, Jan. 18, 1983, 58-6414
Int. Cl.⁴ H01L 29/747
U.S. Cl. 357—39 8 Claims



1. A semiconductor device comprising:
- a first semiconductor layer of a first conductivity type;
- a second semiconductor layer of a second conductivity type laid upon said first semiconductor layer;

a third semiconductor layer of said first conductivity type laid upon said second semiconductor layer;

a first emitter region of said second conductivity type, with a predetermined pattern, said first emitter region being formed in said first semiconductor layer and forming therein a plurality of first islands of said first semiconductor layer;

a second emitter region of said second conductivity type, with a predetermined pattern, said second emitter region being formed in said third semiconductor layer and forming therein a plurality of second islands of said third semiconductor layer;

an auxiliary emitter region of said second conductivity type formed in said third semiconductor layer, said auxiliary emitter region having a predetermined pattern defining a recess;

a first main electrode on the exposed major surface of said first semiconductor layer, said first main electrode contacting said first semiconductor layer and said first emitter region;

a second main electrode on the exposed major surface of said third semiconductor layer, said second main electrode contacting said third semiconductor layer and said second emitter region;

a gate electrode on said exposed major surface of said third semiconductor layer, said gate electrode contacting said third semiconductor layer and said auxiliary emitter region; and

when said first and third semiconductor layers are projected toward a surface parallel to said first and third semiconductor layers, a portion of said first emitter region overlaps a portion of said second emitter region, a portion of said first emitter region is separated from said second emitter region by a separating portion, said overlapping portions and said separating portion being located near said auxiliary emitter region, said separating portion facing said recess of said auxiliary emitter region.

4,641,176

SEMICONDUCTOR PACKAGE WITH CONTACT SPRINGS

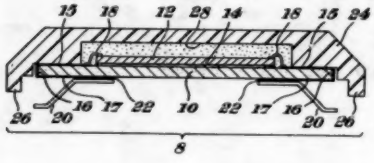
Alain Keryhuel, Pavilly, and Christian Meigne, Barentin, both of France, assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 763,779, Aug. 9, 1985, abandoned, which is a continuation of Ser. No. 705,056, Feb. 26, 1985, abandoned, which is a continuation of Ser. No. 600,291, Apr. 14, 1984, abandoned, which is a continuation of Ser. No. 318,781, Nov. 6, 1981, abandoned. This application Jul. 11, 1986, Ser. No. 885,339

Claims priority, application France, Jan. 26, 1981, 81 01406

Int. Cl.[4] H01L *23/02, 23/50;* H05K *7/12;* H01R *13/02*

U.S. Cl. 357—74 **17 Claims**



1. An integrated circuit packaging system, including an integrated circuit package which comprises;

a planar carrier comprising first and second surfaces, said first surface being adapted for having an integrated circuit affixed thereto,

a lid for enclosing said integrated circuit against said first surface,

a plurality of electrical connections for connecting said integrated circuit to said first surface,

a plurality of electrical conductors for continuing said electrical connections from said first to said second surface, and,

a plurality of elastic contact springs, affixed to project below said second surface, electrically connected to said plurality of conductors, and compressible to press against external contacts to provide electrical connection between an external circuit and said integrated circuit.

4,641,177

PROCESS AND DEVICE FOR PRODUCING A SCREEN IMAGE WITH A THREE-DIMENSIONAL EFFECT IN A TELEVISION RECEIVER

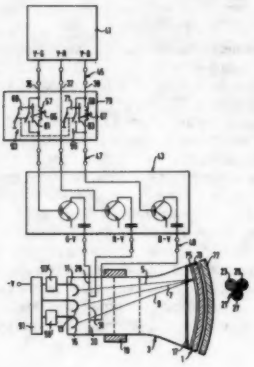
Rolf Ganss, Mexicoring 7, 2000 Hamburg 60, Fed. Rep. of Germany

Continuation of Ser. No. 476,587, Mar. 18, 1983, abandoned. This application Dec. 16, 1985, Ser. No. 809,844

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210089; May 8, 1982, 3217849

Int. Cl.[4] H04N *15/00*

U.S. Cl. 358—3 **24 Claims**



1. Process for producing a television receiver screen image which appears three-dimensional when viewed through anaglyphic eye glasses, the image being produced from monoscopic image signals representing monoscopic images in timed sequence, by superimposing two partial images which are mutually offset by a selected partial image distance, in complementary colours matched with the anaglyphic eye glasses, each of the partial images being derived in the form of a different colour excerpt from each the same monoscopic image, characterized in that the partial image distance is created by mutually time-delaying the partial image signals which produce the associated partial images.

4,641,178

METHOD AND APPARATUS FOR PRODUCING STEREOSCOPIC IMAGES

Graham S. B. Street, Reading, England, assignor to Brightad Limited, United Kingdom

Filed Aug. 7, 1984, Ser. No. 638,414

Claims priority, application United Kingdom, Aug. 12, 1983, 8321727

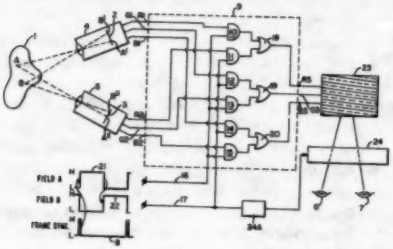
Int. Cl.[4] H04N *15/00*

U.S. Cl. 358—3 **40 Claims**

1. Apparatus for forming a stereoscopic image having first and second spectral components comprising:

image forming means for forming a first image comprising substantially only said first spectral component of a first perspective and said second spectral component of a second perspective during a first period and for forming a second image comprising substantially only said second

spectral component of said first perspective and said first spectral component of said second perspective during a second period; and



alternating means for alternately forming said first and second images.

4,641,179

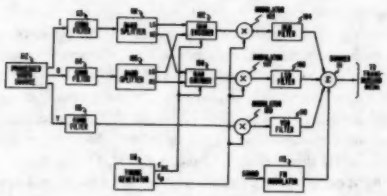
ECONOMICAL HIGH-DEFINITION TELEVISION USING A MODULATED-SIGNAL COMBINATION

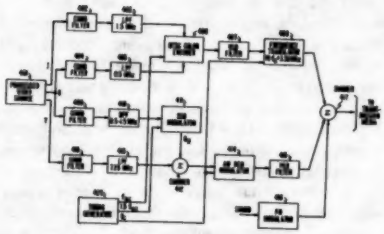
Joseph L. LoCicero, Riverside; Melih Pazarci, Chicago, and Theodore S. Rzeszewski, Lombard, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1984, Ser. No. 684,489

Int. Cl.[4] H04N *11/12*

U.S. Cl. 358—12 **13 Claims**





1. A system for encoding high-definition luminance and chrominance information from a high-definition video source for transmission on a transmission media and said high-definition chrominance information having low-frequency and high-frequency chrominance components, said system comprises:

means for modulating said high-definition luminance information at a transmission carrier frequency;

means for band splitting said high-definition chrominance information into said low-frequency and high-frequency chrominance components;

means for quadrature amplitude modulating said low-frequency chrominance components at a subcarrier frequency;

means for modulating the quadrature amplitude modulated low-frequency chrominance components at said transmission carrier frequency;

means for filtering the carrier frequency modulated quadrature amplitude modulated low-frequency chrominance components to remove the lower sideband resulting from the carrier frequency modulation;

means for quadrature amplitude modulating said high-frequency chrominance components at said subcarrier frequency;

means for modulating the quadrature amplitude modulated high-frequency chrominance components at said transmission carrier frequency;

means for filtering the carrier frequency modulated quadrature amplitude modulated high-frequency chrominance components to remove the upper sideband resulting from the carrier frequency modulated; and

means for combining the carrier frequency modulated high-definition luminance information and the filtered carrier frequency modulated low-frequency chrominance components and the filtered carrier frequency modulated high-frequency chrominance components for transmission on said transmission media.

9. A system for encoding high-definition luminance and chrominance information from a high-definition video source for transmission on a transmission media and said video source having first and second chrominance components and said second chrominance component having high- and low-frequency segments, said system comprises:

means for band limiting said high-definition luminance information;

means for band limiting the high-frequency segment of said second chrominance component;

means for single sideband modulating said band limited high-frequency segment of said second chrominance component;

means for summing said single sideband modulated high-frequency segment of said second chrominance component and said low-pass limited luminance information;

means for double sideband modulating the summed information;

means responsive to said first chrominance component and said low-frequency segment of said second chrominance component for modulating the latter component and segment;

means responsive to the modulated first chrominance component and low-frequency segment of said second chrominance component for frequency translating the latter; and

means responsive to the frequency translated chrominance component and low-frequency segment of said second chrominance component and the summed information for combining the latter for transmission on said transmission media.

4,641,180

ELECTRONIC CIRCUIT APPARATUS FOR SEPARATING THE LUMINANCE AND COLOR INFORMATION OF A COLOR TELEVISION SIGNAL

Hans-Peter Richter, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,088

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1983, 3313050

Int. Cl.[4] H04N *9/78*

U.S. Cl. 358—31 **7 Claims**

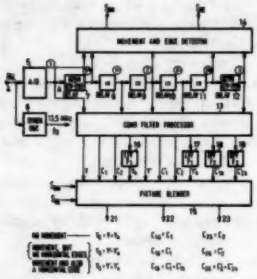
1. Apparatus for separation of the luminance and the color information of a PAL standard television signal having a quadrature modulated color carrier wave, comprising:

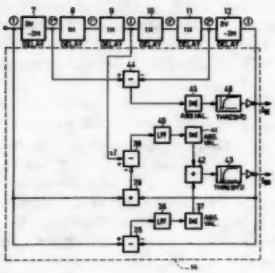
signal delay means (7–12) for delaying said television signal for two television frame periods having input and output connections and having taps for making accessible partially delayed signals, said taps respectively making avail-

able said television signals at delays of one frame less one line, one frame and one frame plus one line:

a first linear matrix (25, 26, 27) for separating luminance and color information, having inputs respectively connected to said signal delay means at said input connection, said output connection and said tap for signals delayed one frame, for combining the signals at its said respective inputs to produce a luminance signal (Y) by adding together the signals at said input and output of said signal delay means and to produce a first chrominance signal (C_1) by subtracting the signals at said tap for signals delayed one frame from the signals at said input connection of said signal delay means and a second chrominance signal (C_2) by subtracting the signals at said output connection of said signal delay means from the signal at said tap for signals delayed one frame;

a second linear matrix (28, 29, 30) having inputs respectively connected to said signal delay means at all three said taps





thereof for combining the signals at its said respective inputs to produce a luminance signal (Y') by adding the signals at said tap making available signals delayed by one frame less one line to the signals at said tap making available signals delayed by one frame plus one line and to produce a first chrominance signal (C_1')by subtracting the signals at said tap making available signals delayed by one frame from the signals at said tap making available signals delayed by one frame less one line and a second chrominance signal (C_2') by subtracting the signals at said tap making available signals delayed by one frame plus one line from the signals at said tap making available signals delayed by one frame;

picture blending means connected to said outputs of said linear matrices and also having a control input for producing blended pictures from said outputs of said linear matrices with a blending mix regarding the respective contributions of said first and second matrices determined by said control input, and

a picture movement detector circuit having inputs respectively connected to said signal delay means at said input connection thereof, said output connection thereof and said tap for signals delayed one frame and having an output connected to said control input of said picture blending means.

6. Apparatus for separation of the luminance and the color information of an NTSC standard color television signal having a quadrature modulated color carrier wave, comprising;

signal delay means (71, 72, 73, 74) for delaying said television signal for two televsion frame periods having input and output connections and having taps for making accessible partially delayed signals, said taps respectively making said television signal available with delays of one frame less one line, one frame, and one frame plus one line;

a first linear matrix circuit, having inputs respectively connected to said input connection, said output connection and said tap for signals delayed one frame of said signal delay means, for combining the signals at its said respective inputs according to the formula $Y=\frac{1}{4}Z^{1}+\frac{1}{2}Z^{0}+\frac{1}{4}Z^{-1}$ for producing an output luminance signal and according to the formula $C=-\frac{1}{4}Z^{1}+\frac{1}{2}Z^{0}-\frac{1}{4}Z^{-1}$ for producing a chrominance output signal, in which formulas Y represents the output luminance signal of said first linear matrix circuit, C represents the output chrominance signal thereof, Z^{1} represents the signal at the input connection of said signal delay means, Z^{0} represents the signal at said tap for signals delayed one frame of said signal delay means and Z^{-1} represents said signal to said output connection of said signal delays means;

a second linear matrix circuit having inputs connected to said signal delay means respectively at all three of said taps for combining the signals at its said respective inputs according to the formula $Y'=\frac{1}{4}Z^{h}+\frac{1}{2}Z^{0}+\frac{1}{4}Z^{-h}$ for producing a second output luminance signal and according to the formula $C'=-\frac{1}{4}Z^{h}+\frac{1}{2}Z^{0}-\frac{1}{4}Z^{-h}$ for producing a second chrominance output signal in which formulas Y' represents the output luminance signal, C' represents the output chrominance signal, Z^{h} represents the signal at said tap making said television signal available at a delay of one frame less one line, Z^{0} represents a signal at said tap for signals delayed one frame and Z^{-h} represents said signal at said tap making available a television signal at a delay of one frame plus one line;

picture blending means connected to said outputs of said linear matrix circuits and also having a control input, and

a picture movement detector having inputs respectively connected to said signal delay means at said input connection thereof, said output connection thereof and said tap for signals delayed one frame, having an output connected to said control input of said picture blending means, and containing means for obtaining first difference signals equal to the absolute value of the difference between the signals at said output of said signal delay means and the signals at said input of said signal delay means, first adding means for obtaining sum signals equal to the sum of said signals at said output of said signal delay means and said signals at said input of said signal delay means, means for obtaining second difference signals equal to the absolute value of the difference between said sum signals and twice the magnitude of said signals at said tap for making available signals delayed one frame, second adding means for adding said first difference signals to said second difference signals to produce second sum signals and invertings means for producing a movement detection signal varying in a manner inverse to the variation of said second sum signals.

4,641,181

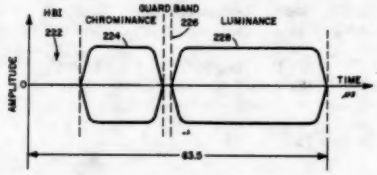
SIGNAL TO NOISE RATIO ENHANCEMENT USING BASEBAND SIGNALS IN AN FM TELEVISION SYSTEM

Joseph G. Mobley, II, Dunwoody, Ga., assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Continuation of Ser. No. 683,680, Dec. 19, 1984, Pat. No. 4,584,599. This application Feb. 21, 1986, Ser. No. 831,516

Int. Cl.⁴ H04N *5/44*

U.S. Cl. 358—36 **12 Claims**



1. An apparatus for improving the signal-to-noise ratio of a television signal angle modulated with line and field scanned luminance information, comprising:

limiter means receiving the television signal, for limiting the amplitude of the television signal to a predetermined value;

a tunable bandpass filter, having a center frequency tunable by a tuning signal, to filter the limited signal from said limiter means;

means for demodulating the filtered signal;

feedback means for delivering the demodulated luminance information to said tunable bandpass filter as the tuning signal, said feedback means comprising delay means for delaying the luminance information by an integral number of line periods.

4,641,182

SYSTEMS AND COMPONENTS FOR DETECTING ELECTROMAGNETIC RADIATION AND DISPLAYING IMAGES PRODUCED THEREBY

Yehoshua Gur, Jerusalem, Israel, assignor to Gur Optics and Systems, Ltd., Jerusalem, Israel

Filed Jun. 26, 1984, Ser. No. 624,845

Claims priority, application Israel, Jun. 26, 1983, 69074

Int. Cl.⁴ H04N *5/225*

U.S. Cl. 358—41 **26 Claims**

24. A display unit for displaying images produced by electromagentic radiation, comprising:

a housing;

a base element rotatably mounted in said housing;

at least one input terminal for connecting to a source of video signals;

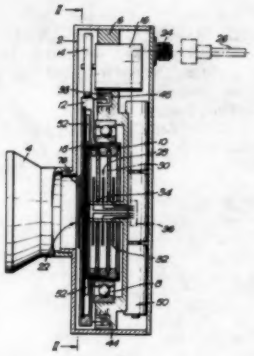
at least one array of mutually spaced output elements located on, and rotatable together with, said base elements;

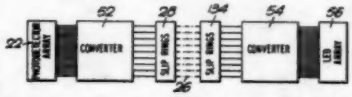
a plurality of signal transmission means feeding said signals via coupling means through converter means from said input terminal to said array of output elements;

means for imparting to said base element a continuous rotary movement, whereby said output elements, adapted to convert said video signals into light signals, rotating together with said base element and lighting up in response to said signals, create the impression of a continuous output image; characterized in that:

said array comprises a plurality of N input elements;

said converter means is a serial-to-parallel converter comprising M input channels and N output channels; and





said input terminal provides connection for M channels, wherein N>>M.

4,641,183

IMAGE PICK-UP APPARATUS

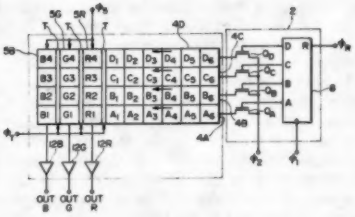
Takao Kinoshita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,990

Claims priority, application Japan, Jul. 16, 1982, 57-124185

Int. Cl.⁴ H04N *9/07*

U.S. Cl. 358—44 **16 Claims**



1. An image pick-up apparatus comprising:

(a) a plurality of horizontal shift registers constructed in a plurality of rows, each of said horizontal shift registers comprising charge transfer devices which are serially connected to each other in the horizontal direction, wherein said charge transfer devices accumulate charges corresponding to incident light and transfer said charges in the horizontal direction through different respective channels;

(b) a plurality of vertical shift registers, each of said vertical shift registers having a plurality of charge transfer cells wherein each of said cells is connected to a corresponding one of the horizontal shift registers; and

(c) driving means for selectively driving said horizontal shift registers row by row to supply said charges to corre-

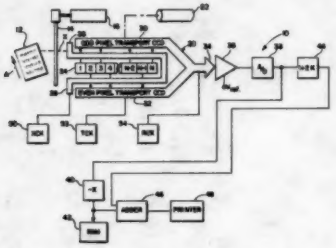
sponding charge transfer cells of said plurality of vertical shift registers.

4,641,184

ELECTRONIC IMAGE SCANNER AND COPIER SYSTEM WITH COLOR MATRIX IMAGE ENHANCEMENT

Lawrence E. Alston, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 14, 1984, Ser. No. 681,788
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 18 Claims



1. A method for electronically sensing an image and processing the electronic signal information so sensed comprising the step of:

sequentially filtering an image defining light in the primary red, green and blue colors and the complementary yellow, cyan and magenta colors;

sensing said filtered image defining light to provide an electrical output signal having red, green, blue, yellow, cyan and magenta color components thereof; and

processing said electrical output signal to provide an enhanced electrical output signal having enhanced red, green, and blue color components thereof wherein: said enhanced red color component is provided as a function of the color matrixing of said red color component of said electrical output signal with said cyan color component of said electrical output signal, said enhanced green color component is provided as a function of the color matrixing of said green color component of said electrical output signal with said magenta color component of said electrical output signal and said enhanced blue color component is provided as a function of the color matrixing of said blue color component of said electrical output signal with said yellow component of said electrical output signal.

7. Image sensing and processing apparatus comprising:

photoresponsive means for sensing the light incident thereto from a subject and providing an electrical output signal therefrom representative of the incident light so sensed;

means for sequentially filtering the light sensed by said photoresponsive means in the primary red, green and blue colors and the complementary yellow, cyan and magenta colors so as to establish red, green, blue, yellow, cyan and magenta color components of said electrical output signal; and

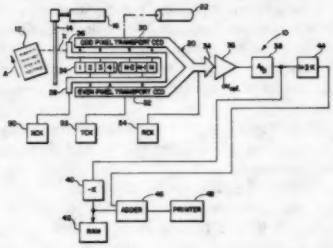
signal processing means for providing an enhanced electrical output signal having enhanced red, green and blue color components thereof, said enhanced red color component being determined as a function of the color matrixing of said red color component of said electrical output signal with said cyan color component of said electrical output signal, said enhanced green color component being determined as a function of the color matrixing of said green color component of said electrical output signal with said magenta color component of said electrical output signal, and said enhanced blue color component being determined as a function of the color matrixing of said blue color component of said electrical output signal with said yellow component of said electrical output signal.

4,641,185

IMAGE SENSING AND PROCESSING APPARATUS AND METHOD

Lawrence E. Alston, Chelmsford, and William T. Freeman, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 18, 1984, Ser. No. 682,894
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 13 Claims



1. Image sensing and processing apparatus comprising:

photoresponsive means for sensing different colors of image defining light incident thereto for each picture element of a selected number of image defining picture elements, and providing a high resolution electrical color separation signal corresponding to each color selected and sensed for each one of said picture elements and a low resolution electrical color separation signal corresponding to each color selected and sensed for selected groupings of said image defining picture elements;

means for storing in memory the low resolution electrical color separation signals; and

signal processing means responsive to the low resolution electrical color separation signals retrieved from said memory and the high resolution electrical color separation signals sensed by said photoresponsive sensing means for providing enhanced high resolution electrical color separation signals for said selected color.

7. A method for electronically sensing an image and processing the electronic signal information so sensed comprising the steps of:

sensing different colors of an image defining light incident thereto for each picture element of a selected number of image defining picture elements and providing a high resolution electrical color separation signal corresponding to each color so sensed for each one of said picture elements and a low resolution electrical color separation signal corresponding to each color so sensed for selected groupings of said image defining picture elements;

storing in memory the low resolution electrical color separation signals; and

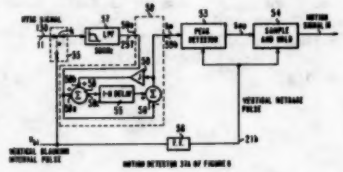
providing enhanced high resolution electrical color separation signals for a selected color from the low resolution electrical color separation signals stored in said memory and the high resolution electrical color separation signals sensed by said photoresponsive sensing means for said selected color.

4,641,186

MOTION DETECTOR THAT EXTRACTS MOTION INFORMATION FROM SIDEBANDS OF A BASEBAND TELEVISION SIGNAL

Dalton H. Pritchard, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 3, 1984, Ser. No. 607,122
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—105 13 Claims



1. A detector responsive to a first component signal from a television signal for producing therefrom a motion indicative signal, comprising:

a band pass filter that operates on video lines of said first component signal for extracting from said first component signal a signal portion in a predetermined frequency band, wherein said predetermined frequency band includes substantial spectral content only when said first signal is representative of a non-stationary picture scene, wherein in said filter a given pair of video lines of said television signal are directly coupled for simultaneous operation therebetween only if the time period separating therebetween is substantially shorter than a field time of said television signal;

means coupled to receive said signal portion that is extracted by said filter for producing in accordance with the amplitude thereof, said motion indicative signal; and wherein

said predetermined frequency band includes a high end frequency, said high end frequency being below the picture frame repetition rate.

4,641,187

METHOD FOR INCREASING CONTRAST BETWEEN AN OBJECT AND SPACE WHEN PHOTOGRAPHING SUCH AN OBJECT WITH A TELEVISION CAMERA

Norbert Neuroth, Mainz, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 694,183
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1984, 3402132
Int. Cl.[4] H04N 7/18, 5/30
U.S. Cl. 358—106 20 Claims

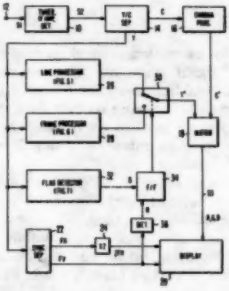
1. A method of increasing the contrast between an object and space when photographing a transparent object, the method comprising: with a radiation source, illuminating a transparent object with radiation in a region of the spectrum having wavelengths to which the transparent object is impermeable; filtering said radiation before impinging on said transparent object to block radiation having wavelengths to which said transparent object is permeable and to pass radiation having wavelengths to which said transparent object is impermeable; and, with a camera, photographing said object from the side of the object opposite the radiation source thereby obtaining a contour image of said object, said camera being capable of detecting radiation in the wavelength region being transmitted from the filtering step.

4,641,188

PROGRESSIVE SCAN DISPLAY SYSTEM EMPLOYING LINE AND FRAME MEMORIES

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1985, Ser. No. 760,909
Int. Cl.[4] H04N 7/01
U.S. Cl. 358—140 4 Claims



1. a progressive scan display system, comprising:

(a) input means for receiving a video input signal of a given line rate and including an identification signal having a first condition for signifying the presence in said video input signal of a first pair of sequential fields representative of a common scene and having a second condition for signifying the presence in said video input signal of a second pair of sequential fields not representative of a common scene;

(b) first progressive scan processor means coupled to said input means for doubling the line rate of said video input signal including line stores for storing a line of said video input signal and recovering the stored line twice during one line interval to provide a first line store processed video output signal;

(c) second progressive scan processor means coupled to said input means for doubling the line rate of said video input signal including frame store means for storing at least one frame of said video input signal and recovering the stored frame twice during one frame interval to provide a second frame store processed signal;

(d) detector means coupled to said input means for detecting said identification signal and providing a control signal;

(e) display means; and

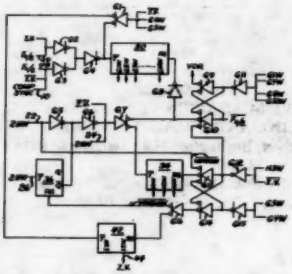
(f) switch means coupled to receive said frame store processed and line store processed video output signals and responsive to said control signal for coupling said frame store processed video output signal to said display means for display of each said first pair of fields representative of said common scene and for coupling said line store processed video output signal to said display means for display of each said second pair of fields not representative of a common scene.

4,641,189

DIGITAL VERTICAL SYNC FILTER

Julian E. Warrick, Palatine, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 11, 1983, Ser. No. 540,740
Int. Cl.[4] H04N *5/10*
U.S. Cl. 358—154 **36 Claims**



1. A method for extracting vertical sync information from a composite sync signal including (a) horizontal sync signals related to a horizontal frequency and having first durations and (b) vertical sync signals having second durations longer than said first durations, the method comprising the steps of:

determining respective durations of signals within the composite sync signal;

detecting the occurrence of a signal within said composite sync signal enduring longer than said first duration, based on said determining step; then

detecting the occurrence of signals within said composite sync signal enduring for at least a third duration longer than said first duration, based on said determining step; then

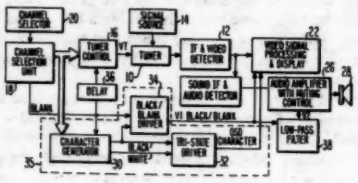
generating a vertical drive signal in response to said second detecting.

4,641,190

MUTING SYSTEM

William J. Testin, and Juri Tults, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed May 10, 1985, Ser. No. 733,215
Int. Cl.[4] H04N *5/60*
U.S. Cl. 358—165 **12 Claims**



1. In a television receiver, including channel selection means, tuning means for tuning said receiver to a channel, and audio channel signal processing means for providing an audio output, audio muting apparatus comprising:

muting means associated with said audio channel signal processing means and having selectable muting and non-muting modes of operation wherein, when said muting mode is selected, said audio output is gradually reduced such that, following the lapse of a muting time interval, said audio output is substantially completely muted; and

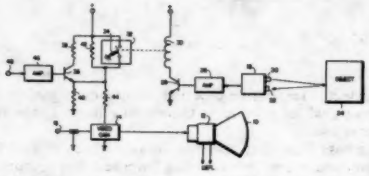
control means coupled to each of said tuning means and said muting means and being responsive to said channel selection means selecting a channel not presently being received for selecting said muting mode so as to begin a period of continuous muting; and thereafter, following the lapse of a first predetermined time delay, longer than said muting time interval, causing said tuning means to tune said receiver to said selected channel.

4,641,191

STANDBY SYSTEM FOR VIDEO DISPLAY

Leroy Sutton, Wheeling, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 7, 1983, Ser. No. 559,163
Int. Cl.[4] H04N *5/57*
U.S. Cl. 358—168 **1 Claim**



1. A video display system comprising:

a CRT;

video means including a video gain block for supplying information to said CRT for display;

a source of B+ potential;

a pair of resistors serially connected between said source of B+ potential and said gain block, said pair of resistors reducing the B+ potential available to said gain block sufficiently to operate said CRT at a low brightness level;

sensing means, including an ultrasonic transmitter and an ultrasonic receiver, for detecting the presence of a movable object in a predetermined area adjacent said CRT by reflection of ultrasonic energy;

switching means coupled to said sensing means for shorting out one of said resistors and enabling full operating potential to be applied to said video gain block for producing a high brightness display responsive to the presence of said movable object in said predetermined area;

time delay means for maintaining said high brightness display for a time after removal of said movable object from said predetermined area; and

a transistor having an output circuit coupled across said resistor for overriding said sensing means and producing a high brightness display independent of the presence of said movable object in said predetermined area whenever said transistor is energized.

4,641,192

FOCUS-CORRECTED CONVERGENT BEAM SCANNER

Neal Diepeveen, Fair Lawn, and Robert Bastian, Wyckoff, both of N.J., assignors to Magnavox Government and Industrial Electronics Company, New York, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,200
Int. Cl.[4] H04N *3/08, 3/09*
U.S. Cl. 358—206 **7 Claims**

1. An image pickup device comprising:

lens means arranged to receive light from a scene and to form an image of the scene in an image surface, said lens means having an optical axis;

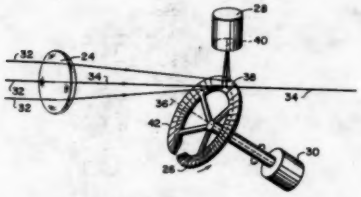
a mirror annulus rotatable about an axis of rotation, said mirror annulus being arranged behind the lens means and having a reflecting surface to reflect light from the scene which is passed through the lens means; and

detector means arranged to receive light from the scene which has been reflected by the mirror annulus;

characterized in that:

the mirror annulus has a circumferential axis which intersects the optical axis through the entire rotation of the mirror annulus;

the reflecting surface is arranged at a tilt angle about the circumferential axis, the tilt angle of the reflecting surface varying as a function of the position of the reflecting surface along the circumferential axis; and



the circumferential axis is arranged on the optical axis at a distance from the lens means, the distance varying as a function of the tilt angle of the reflecting surface such that the image surface is always reflected onto the detector means.

4,641,193

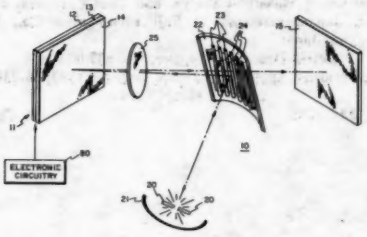
VIDEO DISPLAY APPARATUS AND METHOD

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,227

Int. Cl.[4] H04N 5/74

U.S. Cl. 358—233 **15 Claims**



1. Apparatus for receiving frames of video signals and displaying images represented by said video signals, comprising:

a semiconductor substrate, having an array of columns and rows of devices formed therein, said devices comprising: first and second spaced doped regions; an insulator layer disposed over the region between said doped regions; a gate electrode disposed over said insulating region; and a conductive deflection electrode coupled to said second doped region;

a plurality of column input conductors, each said column input conductor being coupled to the first doped region of the devices of at least one column;

a plurality of row gate input conductors, each said row gate input conductor being coupled to the gates of the devices of at least one row;

a video line store;

means for reading a line of video signals into elements of said line store;

means for applying the signals from elements of said line store to respective ones of said column input conductors;

means for successively applying enabling signals to said row gate input conductors;

means for applying a reference potential to the even rows of devices of said array during one field of a video frame, and for applying said reference potential to the odd rows of devices of said array during the other field of a video frame;

a conductive/reflective layer spaced from said deflection electrodes;

a layer of deformable material disposed between said deflection electrodes and said conductive/reflective layer; and

optical means for converting deformations of said conductive layer into an image.

4,641,194

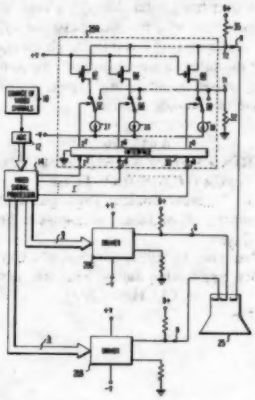
KINESCOPE DRIVER IN A DIGITAL VIDEO SIGNAL PROCESSING SYSTEM

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 27, 1984, Ser. No. 644,398

Int. Cl.[4] H04N 5/68, 9/16

U.S. Cl. 358—242 **11 Claims**



1. A digital video signal processing system comprising:

a source of digital signals including a plurality of bits, representative of video information;

an image display device having an intensity control electrode; and

a display driver amplifier, having a plurality of inputs for receiving respective bits of said digital signal, for combining signals relating to said bits of said digital signal at an output combining point so as to directly produce at said output combining point an analog signal representing said video information with a magnitude suitable for directly driving said intensity control electrode.

4,641,195

SCANNING SPEED MODULATING APPARATUS FOR TELEVISION RECEIVER

Fumio Inoue, Yokohama; Masahiro Eto, Fujisawa; Shoei Shimaoka, Yokohama, and Noboru Sakai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 724,832

Claims priority, application Japan, Apr. 20, 1984, 59-78429

Int. Cl.[4] H04N 5/68

U.S. Cl. 358—242 **14 Claims**

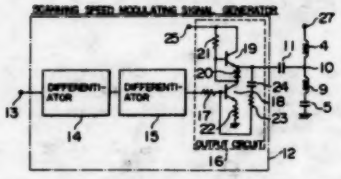
1. A scanning speed modulating apparatus for a television receiver, comprising:

a horizontal deflecting coil supplied with a horizontal deflecting signal from a horizontal deflecting circuit for deflecting horizontally an electron beam;

a differentiator circuit for differentiating a waveform of a video signal; and

a scanning speed modulating signal supply circuit for ampli-

fying an output signal from said differentiator circuit to a requisite level to supply a current having a waveform corresponding to the differentiated waveform of said video signal to said horizontal deflecting coil, to thereby enhance the sharpness of an image produced by said television receiver, said scanning speed modulating signal



supply circuit including an inductance element connected in series to said horizontal deflecting coil, an impedance element connected to a junction between said horizontal deflecting coil and said inductance element, and a scanning speed modulating signal output circuit for supplying a scanning speed modulating signal to said junction through said impedance element.

4,641,196

METAL RING PREVENTING IMPLOSION OF CATHODE-RAY TUBE

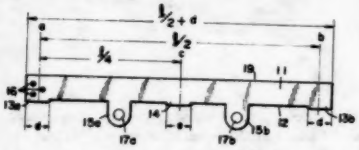
Kazuhiko Muuka, Nagoya; Kohichi Tago, and Hidetoshi Kato, both of Ichinomiya, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 16, 1984, Ser. No. 674,958

Claims priority, application Japan, Mar. 16, 1983, 58-43807

Int. Cl.[4] H04N *5/65*

U.S. Cl. 358—246 **5 Claims**



1. A metal ring adapted to be fitted on a maximum outer length part of a cathode-ray tube for preventing the implosion of the cathode-ray tube, said metal ring comprising at least two metal strip members each formed with the same shaped welding reference projections at the end portions thereof, said strip members including fixing parts between said end portions and a central bending reference projection between said fixing parts, said strip members being bent while being positioned by means of said central bending reference projection so that an annular body formed by connecting these metal strip members has a shape similar to said maximum outer peripheral length part of the cathode-ray tube, said metal strip members being welded together while being positioned by overlapping said welding reference projections.

4,641,197

IMAGE PROCESSING METHOD OR APPARATUS

Ken Miyagi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 314,442, Oct. 23 1981. This application Jun. 26, 1984, Ser. No. 624,795

Claims priority, application Japan, Oct. 30, 1980, 55-152794; Oct. 30, 1980, 55-152795; Oct. 30, 1980, 55-152797

Int. Cl.[4] H04N *1/387*

U.S. Cl. 358—280 **52 Claims**

1. An image processing method comprising the steps of:

entering document image data;

generating character image data;

controlling storage of said document data and said character data in a memory in such a manner that one of said document image data and said character image data is stored in an area of said memory and the other of said document

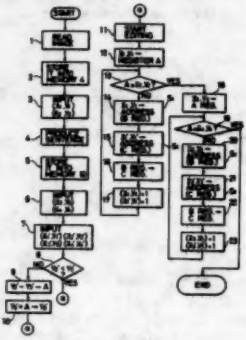


image data and said character image data is automatically arranged to be stored in a different area of said memory; and

reproducing an image on the basis of the data stored in said memory.

4,641,198

METHOD OF AND APPARATUS FOR RECORDING VIDEO SIGNAL ASSOCIATED WITH PHOTOGRAPHIC IMAGE

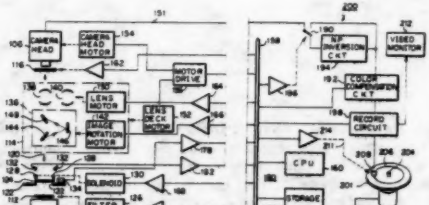
Takahiro Ohta; Masafumi Inuiya, and Ikuo Fujisawa, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

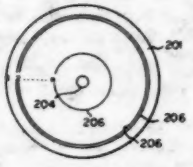
Filed Dec. 27, 1984, Ser. No. 687,003

Claims priority, application Japan, Dec. 30, 1983, 58-248082

Int. Cl.[4] H04N *1/04*

U.S. Cl. 358—285 **18 Claims**





1. A method of recording photographic images by picking up a group of photographic images, recorded in horizontal and vertical positions in substantially equally dimensioned frames,

to store, in a storage medium, video signals representative of the photographic images in the order of the group of photographic images, comprising the steps of:

selecting a frame orientation from among a plurality of frame orientations, said plurality of frame orientations including at least the vertical and horizontal positions of the photographic images recorded in the respective frames;

selecting a particular photographic image which is in said selected frame orientation from among the group of photographic images;

setting a relative rotation of the photographic images with respect to the selected frame orientation;

setting, for the photographic images in the vertical position, a magnification for formation of a video signal which is smaller than a magnification for the photographic images in the horizontal position;

picking up the selected particular photographic image to store the video signal representative of the particular photographic image in a store position of the storage medium which is assigned to the particular photographic image;

performing said steps of selecting and picking up on each said photographic image which is in the selected frame orientation; and

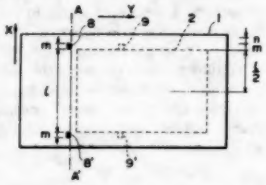
performing said preceding steps on each of the remaining frame orientations, whereby the above procedure is repeated for desired frame orientations.

4,641,199

IMAGE READING APPARATUS

Ken Miyagi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 533,958
Claims priority, application Japan, Sep. 29, 1982, 57-170636
Int. Cl.[4] H04N *1/04, 1/40*
U.S. Cl. 358—285 6 Claims



1. An image reading apparatus comprising:

plural image sensors for scanning an original image on a line by line basis, said plural image sensors being arranged to scan an overlapping portion of the original image;

plural markers provided at both ends, with respect to a scanning direction of said plural image sensors, in an effective scanning area to be scanned by said sensors;

detecting means for detecting the amount of overlapping portion scanned by said plural image sensors in accordance with signals generated from said plural image sensors, respectively, through scanning of said plural markers; and

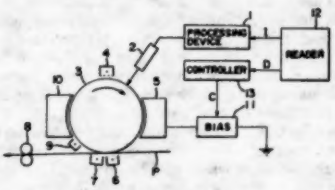
eliminating means for eliminating image signal corresponding to the overlapping portion from image signals generated from said plural image sensors, respectively, through scanning of the original image, in accordance with the amount of overlapping portion detected by said detecting means.

4,641,200

IMAGE REPRODUCING APPARATUS WITH VARIABLE AC BIAS

Hisashi Shoji; Satoshi Haseda, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,416
Claims priority, application Japan, Feb. 10, 1984, 59-22018; Mar. 15, 1984, 59-48245; Mar. 15, 1984, 59-48246
Int. Cl.[4] H04N *1/21, 1/23, 1/29*; G03G *15/00*
U.S. Cl. 358—296 15 Claims



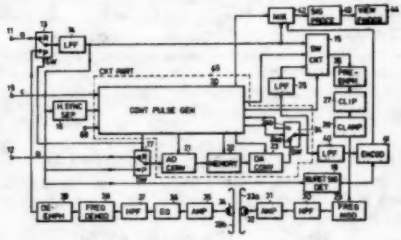
1. In an image reproducing apparatus of the type which includes a plurality of latent image forming means and which develops a latent image formed by said latent image forming means on an image retainer by developing means in which a developing bias is applied, the improvement comprising means to provide a developing bias having an oscillating component and for applying said component in accordance with the difference between latent images formed by said plurality of latent image forming means.

4,641,201

COLOR VIDEO SIGNAL TRANSMITTING APPARATUS

Yutaka Ichinoi, Yokohama, and Naomichi Nishimoto, Tachikawa, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Mar. 15, 1984, Ser. No. 590,077
Claims priority, application Japan, Mar. 17, 1983, 58-44767
Int. Cl.[4] H04N *9/80*
U.S. Cl. 358—310 8 Claims



1. A color video signal transmitting apparatus comprising:

first and second input terminals supplied in parallel with a time base compressed luminance signal and a first time base compressed line-sequential color difference signal which have been time base compressed with the same time base compression rate and are obtained from one or a plurality of pickup elements of a television camera, said time base compressed luminance signal and said first time base compressed line-sequential color difference signal being obtained from said one or a plurality of pickup elements by changing an effective horizontal scanning period of said one or a plurality of pickup elements to a predetermined scanning period which is shorter than an

effective horizontal scanning period which is required to obtain a standard system video signal;

time base compressing means supplied with said first time base compressed line-sequential color difference signal through said second input terminal, for subjecting said first time base compressed line-sequential color difference signal to a further time base compression so as to produce a second time base compressed line-sequential color difference signal;

a third input terminal supplied with a first synchronizing signal from a synchronizing signal generator within said television camera;

signal generating circuit means for obtaining, in phase with said first synchronizing signal which is supplied thereto through said third input terminal, a second synchronizing signal which has a predetermined width, and for obtaining for every two regular horizontal scanning periods a discriminating signal which is used to discriminate either one of two kinds of time base compressed color difference signals which make up said second time base compressed line-sequential color difference signal, to produce a multiplexed signal in which said second synchronizing signal and said discriminating signal are multiplexed;

time-division-multiplexed signal obtaining means supplied with said time base compressed luminance signal, said second time base compressed line-sequential color difference signal, and said multiplexed signal, for obtaining a time-division-multiplexed signal, said time-division-multiplexed signal being obtained by performing a time-division-multiplexing in which said two kinds of time base compressed color difference signals are alternately time-division-multiplexed for every one regular horizontal scanning period and in which one of said two kinds of time base compressed color difference signals, said time base compressed luminance signal, and said multiplexed signal are time-division-multiplexed within one regular horizontal scanning period;

transmitting means for transmitting said time-division-multiplexed signal from said time-division-multiplexed signal obtaining means to a transmitting path;

reproducing means for reproducing said time-division-multiplexed signal which is obtained through said transmitting path;

signal processing circuit means for processing at least said time base compressed luminance signal within the reproduced time-division-multiplexed signal from said reproducing means into a signal format suited for display of a picture without subjecting said time base compressed luminance signal to a time base expansion; and

an electronic viewfinder supplied with an output signal of said signal processing circuit means for at least displaying a picture of said time base compressed luminance signal.

4,641,202

SKIP FIELD COLOR RECORDING APPARATUS

Yoshiyuki Nakamura, Tokyo; Tetsuro Kato, and Norio Ebihara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,743

Claims priority, application Japan, Sep. 8, 1983, 58-163889

Int. Cl.[4] H04N *9/491*

U.S. Cl. 358—313 **4 Claims**

1. Apparatus for reproducing a video signal occurring in successive fields of successive horizontal line signals and having a field identification signal for each said field, said apparatus having a driving mechanism for driving a magnetic tape on which said video signal is recorded in successive video tracks, and transducing head means for reproducing said video signal from said successive video tracks and being mounted on a cylindrical drum about which said magnetic tape is wrapped, said transducing head means having a bimorph plate and a transducing head mounted thereon, said apparatus comprising:

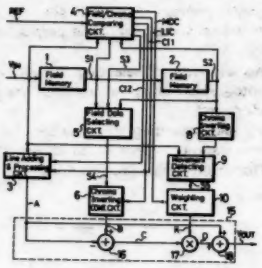
memory means for storing a one field delayed video signal and a two field delayed video signal delayed from said reproduced video signal by one and two fields, respectively;

a source of a reference signal occurring in successive fields and including a reference field identification signal for each field;

comparing means for comparing said reference field identification signal of said reference signal with said field identification signal of said reproduced video signal and for producing a comparison output signal;

deriving means for selectively deriving one of said one field and two field delayed video signals in response to said comparison output signal of said comparing means and for producing the derived signal as a selected video signal;

adding means for adding at least two successive horizontal



line signals of said reproduced video signal and for generating an averaged video signal therefrom;

detecting means for detecting a movement of an image corresponding to said reproduced video signal by comparing said reproduced video signal with an output video signal from said memory means and providing a respective detected output signal;

means for generating a weighting signal in response to said detected output signal of said detecting means;

weighting means for weighting said averaged video signal from said adding means and said selected video signal from said deriving means in response to said weighting signal to produce a weighted output signal; and

means for combining said weighted output signal with said averaged video signal.

4,641,203

APPARATUS FOR STORING AND RELATING VISUAL DATA AND COMPUTER INFORMATION

Richard L. Miller, 233 Broadway, Ste. 3612, New York, N.Y. 10007

Division of Ser. No. 243,577, Mar. 13, 1981, Pat. No. 4,425,586. This application Jan. 6, 1984, Ser. No. 568,737

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—335 **2 Claims**

1. An information storage system, comprising:

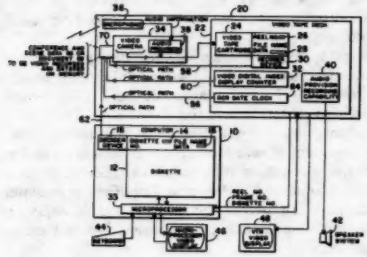
(a) a recording medium for storing encoded data, a casing for housing said recording medium and having means for storing encoded identification data relating to the casing and independent from the data encoded on the recording medium contained within the casing;

(b) receiving means in said storage system for receiving said recording medium in the casing when inserted therein;

(c) reading means in said storage system for reading the data contained on the recording medium when inserted in said receiving means;

(d) decoding means for decoding the identification data on said casing when inserted in said receiving means; and

(e) means in said storage system for entering the decoded



identification data decoded from said casing onto said recording medium contained within said casing and integratingly associating such identification data with the data stored on the recording medium.

4,641,204

RECORDING AND REPRODUCING SYSTEM FOR RECORDING BOTH ANALOGUE AND DIGITAL INFORMATION ON AND FROM A DISC

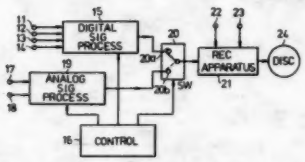
Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 14, 1984, Ser. No. 640,757

Claims priority, application Japan, Aug. 19, 1983, 58-151347

Int. Cl.[4] G11B 7/00; H04N 5/781

U.S. Cl. 358—341 **6 Claims**



1. A recording and reproducing system for recording and reproducing signals on and from a rotary recording medium which is recorded with composite video signal of a predetermined television signal so that the rotary recording medium is compatibly playable on a reproducing apparatus which is primarily designed to play a rotary recording medium which is recorded with a composite video signal of another television system, said recording and reproducing system comprising:

recording means for recording signals on the rotary recording medium by forming analog recorded track turns and digital recorded track turns on the same surface of the rotary recording medium, said analog recorded track turns being recorded with a modulated signal, said modulated signal being a first information signal which at least includes the composite video signal of said predetermined television system and is subjected to an analog modulation, said digital recorded track turns being recorded with digital signals which are time-sequentially multiplexed in terms of blocks with a predetermined transmission frequency, each block of said digital signals at least including modulated digital data, said modulated digital data being a second information signal which is subjected to a digital modulation, said predetermined transmission frequency being selected so that a transmission frequency of the digital signals reproduced from said rotary recording horizontal synchronizing signal is reproduced from said rotary recording medium with the same frequency as a horizontal scanning frequency of said other television system;

reproducing means for picking up and reproducing recorded signals from the track turns of said rotary recording medium;

a first reproducing circuit for reproducing said first information signal from a reproduced signal which is received from said reproducing means;

a second reproducing circuit for reproducing said second information signal from the reproduced signal which is received from the reproducing means;

a master clock signal generating circuit for supplying to said second reproducing circuit a master clock signal having a constant frequency; and

a control circuit for controlling a motor which rotates said rotary recording medium, responsive to a signal obtained from a part of said master clock signal generating circuit, so that a horizontal scanning frequency of the composite video signal is reproduced from said rotary recording medium with the horizontal scanning frequency of said other television system.

4,641,205

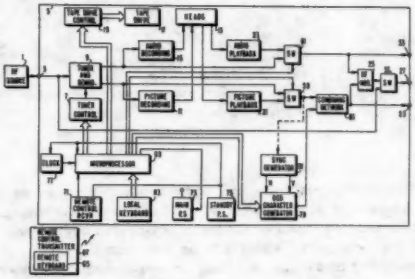
TELEVISION SYSTEM SCHEDULER WITH ON-SCREEN MENU TYPE PROGRAMMING PROMPTING APPARATUS

Billy W. Beyers, Jr., Hancock County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 5, 1984, Ser. No. 586,270

Int. Cl.[4] G11B 31/00; H04N 5/782

U.S. Cl. 360—33.1 **21 Claims**



1. In a television system including tuner means for selecting RF signals modulated with picture information corresponding to respective channels; channel selection means for controlling said tuner means including digit switches for selecting channels; demodulation means for demodulating said RF signals to generate a video signal corresponding to said picture information; first coupling means for coupling said video signal to a display device having a screen for displaying an image corresponding to said picture information; and a scheduler including memory means for storing time (including time of day and date) and channel information corresponding to respective programs occurring in the future; clock means for indicating the present time; and scheduler control means for causing said channel selection means to select the channel corresponding to one of said programs when the present time corresponds to the starting time of said one of said programs; programming apparatus for allowing a user to program said schedule in a plurality of programming modes including at least a clock setting mode, a normal mode for scheduling programs for selection only once and a daily mode for scheduling programs for selection on a daily basis, comprising:

character generator means for generating character signals suitable for displaying alpha-numeric characters on said screen of said display device;

second coupling means for coupling said character signals to said display device;

a user operable programming switch; and

programming control means responsive to the operation of said programming switch for causing said character generator means to generate character signals for displaying a numbered list of said programming modes and for enabling said digit switches to select said programming modes and thereafter being responsive to the operation of one of said digit switches for causing said character generator to generate character signals for displaying prompting instructions for guiding a user to operate said digit switches to enter numerical information for a respectively numbered one of said programming modes.

4,641,206

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS INCLUDING A NOISE REDUCTION CIRCUIT

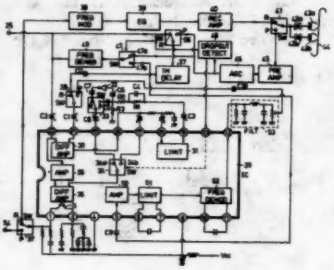
Kasuke Iwafune, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 29, 1984, Ser. No. 584,736

Claims priority, application Japan, Mar. 1, 1983, 58-34126

Int. Cl.[4] H04N 5/78

U.S. Cl. 360—33.1 **3 Claims**



1. A video signal recording and reproducing apparatus including a noise reduction circuit, said apparatus comprising:

a frequency modulator for frequency-modulating a recording video signal which is to be recorded;

recording means for recording an output frequency modulated recording video signal of said frequency modulator onto a recording medium;

demodulating means including first means for reproducing the recorded frequency modulated video signal from the recording medium and second means for demodulating the reproduced frequency modulated video signal back into the original video signal;

a noise reduction circuit for reducing a noise component in the output reproduced video signal of said demodulating means by pre-emphasizing portions of the video signal at the time of the recording and correspondingly de-emphasizing the pre-emphasized video signal portions at the time of the reproduction, said noise reduction circuit comprising a first delay circuit having a delay time of one horizontal scanning period for producing a delayed reproduced video signal from an output video signal of said first or second means of said demodulating means, a first differential amplifier supplied directly with the output reproduced video signal of said demodulating means and with the output delayed reproduced video signal of said first delay circuit, a first limiter for amplitude-limiting an output signal of said first differential amplifier, and a subtracting circuit for performing a subtraction between the output reproduced video signal of said demodulating means and an output signal of said first limiter;

a second differential amplifier supplied directly with said recording video signal to one input terminal thereof;

a second delay circuit for delaying said recording video signal by a delay time of one horizontal scanning period, and for supplying a delayed recording video signal to another input terminal of said second differential amplifier;

a second limiter for amplitude-limiting an output video signal component of said second differential amplifier, to a limiting level which is approximately in the same range as a limiting level of said first limiter;

an adding circuit for adding an output limited video signal component of said second limiter to said recording video signal, a common differential amplifier being used as said first and second differential amplifiers, a common delay circuit being used as said first and second delay circuits, a common limiter being used as said first and second limiters; and

circuit means for selectively supplying the output limited video signal component of said common limiter to said subtracting circuit with the phase thereof inverted at the time of the recording, and for selectively supplying the output signal of said common limiter to said subtracting circuit with the phase thereof unchanged at the time of the reproduction, so that said subtracting circuit can also be used as said adding circuit.

4,641,207

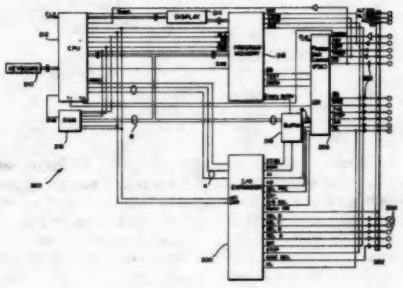
DIAGNOSTIC DEVICE AND METHOD FOR EXAMINING THE OPERATION OF A DISK DRIVE

George D. Green; Lauren M. Laboe, both of 4801 Guilford Rd., College Park, Md. 20740, and Richard Cook, 413 W. Side Dr., Gaithersburg, Md. 20878

Filed Mar. 22, 1983, Ser. No. 477,707

Int. Cl.[4] G11B 5/02; G06F 11/00, 11/22, 3/02

U.S. Cl. 360—55 **36 Claims**



1. In a system including (a) a disk drive having a plurality of input terminals and output terminals and (b) a host computer adapted to be connected to the input terminals and the output terminals, an external device for examining the operation of the disk drive and the communication between said host computer and said disk drive, the device comprising:

a plurality of connector points;

means for selectively coupling each connector point to any one of a plurality of input terminals or output terminals of a disk drive when the order of a connector points on the device differs from the order of corresponding terminals on the drive;

switching means for selectively connecting the input and output terminals of said disk drive and said host computer;

first means for sensing signals at each of at least some of the input terminals and output terminals, said first means monitoring the communication between said disk drive and said host computer, when said disk drive and said hos

computer are interconnected by said switching means, to detect a deviation from standard disk drive responses;

second means for providing signals from the device to the input terminals of the drive, the drive responding to each provided signal at a corresponding input terminal as if a signal from the host computer were received at the same input terminal; and

mode select means for selectively inhibiting the enabling of the second means when the host computer is connected to provide signals to and receive signals from at least some of said terminals.

4,641,208

RECORDING/REPRODUCING APPARATUS

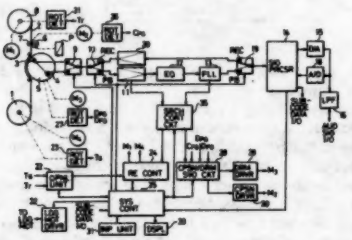
Yoshizumi Inazawa, Kanagawa; Toshihiko Takahashi, Chiba; Toshiyuki Tani, Kanagawa, and Shigeyuki Satomura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,746

Claims priority, application Japan, Dec. 24, 1984, 59-272545

Int. Cl.[4] G11B *27/28*

U.S. Cl. 360—72.2 **12 Claims**



1. A recording/reproducing apparatus comprising:

head means for recording a plurality of informational signal programs in sequence on a record medium in an initial recording operation of the apparatus;

means operative in said initial recording operation for causing said head means to record on said record medium, at locations corresponding to beginning portions of said informational signal programs, distinctive program identifying signals representing respective numbers arranged in sequence for identifying the respective informational signal programs;

means for causing said head means to record at least one additional informational signal program on said record medium in at least one subsequent recording operation; and

means operative in each said subsequent recording operation for causing said head means to record on said record medium, at a location corresponding to a beginning portion of each said additional informational signal program, a standard program start signal.

4,641,209

DISC TYPE INFORMATION STORAGE AND RETRIEVAL SYSTEM

Kobert R. Smith, II, Los Altos Hills, Calif., assignor to Micro Storage Ltd., Manhattan Beach, Calif.

Filed Nov. 28, 1983, Ser. No. 555,892

Int. Cl.[4] G11B *5/012, 21/06, 23/03*

U.S. Cl. 360—86 **35 Claims**

1. An information storage and retrieval assembly, comprising:

(a) a cartridge type of information storage disc arrangement having a cartridge housing and a storage disc including a disc body mounted within said housing for rotation about a central axis of rotation, said body including opposite sides, at least one of which includes information stored or storable magnetically thereon in a given storage area extending concentrically around said central axis;

(b) an information storage and retrieval arrangement including

(i) means supporting said disc arrangement with the storage disc mounted in its housing in a predetermined operating position for rotation of said disc body about its central axis,

(ii) means including a magnetic read/write head and means supporting said head for movement back and forth along a fixed, straight line path radially across said information containing area on said disc body and in sufficiently close proximity to said area to magnetically store information in order to retrieve information from said area, and

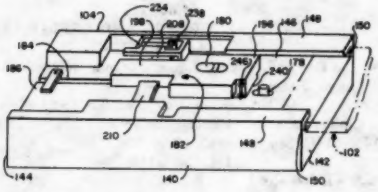
(iii) means for engaging said disc body directly at a location spaced from the disc's central axis but in a way which rotates said disc body about its central axis, in both one direction and in an opposite direction, about said axis, when said disc arrangement is in said predetermined operating position; and

(c) means for moving said read/write head back and forth along said straight line path.

28. An information storage and retrieval assembly, comprising:

(a) an information storage disc arrangement including

(i) a disc shaped body having a central axis of rotation and opposite top and bottom sides, said top side including information stored magnetically thereon in a first area extending concentrically around said central axis,



(ii) a spiral groove in a second area on the top side of said disc body, said groove being concentrically disposed around said central axis and serving as a read head guide track and

(iii) a central hub connected with and extending downward from the bottom side of said disc body in a coaxial relationship with said body and radially inward of said first and second areas, said hub serving as a gear for rotating the disc body about its central axis when the hub itself is rotated; and

(b) an information retrieval arrangement including

(i) means supporting said disc arrangement in a predetermined position for rotation about the central axis of its disc body,

(ii) means for guiding said disc arrangement into said predetermined position along a horizontally extending path only without having to drop the disc arrangement onto an awaiting spindle or like drive mechanism,

(iii) means including a magnetic read/write head for storing the information on or retrieving it from the top side of said disc body,

(iv) means for supporting said read/write head for movement back and forth along a fixed straight line path radially across the information containing area on the top side of said disc body and in sufficiently close proximity to said first area to magnetically store the information on or retrieve it from said area, said read/write head support means including a fixed support structure, a carriage on which said read head is mounted, and a plurality of ball bearings supporting said carriage on said fixed structure for back and forth movement in a

fixed plane along its own straight line path in order to move said read/write head along its straight line path, said fixed support structure and said carriage together defining an elongated race for each of said ball bearings,

(v) a needle mounted to and for movement with said carriage and positioned for engagement with said spiral groove such that rotation of the spiral groove in either of opposing directions about said central axis causes said needle to move back and forth along its own straight line path which in turn causes said read/write head support means to move back and forth about its straight line path, thereby moving said read/write head back and forth along its straight line path, and

(vi) means for rotating said hub in one direction and an opposing direction around its axis in a controlled manner when said disc arrangement is in said predetermined position whereby said read/write head can be precisely positioned on its straight line path of movement for retrieving information in a controlled, predetermined fashion, said rotating means including a reversible motor which includes an output shaft rotatable both in one direction and an opposing direction about its own axis, said motor being mounted to said support structure, and a gear forming part of said output shaft, said gear being positioned for engagement with said hub when said disc arrangement is placed in said predetermined position, said gear and said hub being configured such that rotation of said gear causes said hub to rotate when the two are in engaging relationship with one another.

4,641,210

MAGNETIC RECORDING AND REPRODUCING APPARATUS

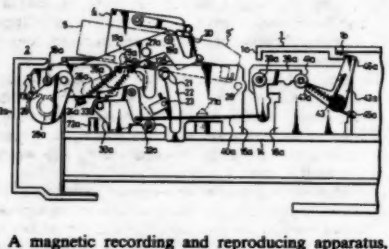
Masao Ohyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,580

Claims priority, application Japan, Sep. 24, 1983, 58-146688[U]; Sep. 24, 1983, 58-146690[U]

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—96.5 **9 Claims**



1. A magnetic recording and reproducing apparatus, for recording or reproducing a signal on a magnetic tape contained in a tape cassette, comprising:

a housing including a front panel having an opening formed therein; and

a movable section including support means movable substantially horizontally through said opening between an open position in which said movable section extends forwardly from said housing and a closed position in which said movable section is contained within said housing;

said movable section further including cassette mounting means for receiving said cassette and moving said received cassette relative to said support means between an operative lowered position in which the cassette can move through said opening and a raised eject position out of said housing and in which said cassette may be removed from said apparatus, and a magnetic head assembly mounted on said support means for movement therewith and being adapted for recording or reproducing a signal on the tape of a cassette in said operative position;

said cassette mounting means holding said cassette in said operative position when said movable section is moved to said closed position.

4,641,211

DISK CARTRIDGE LOADING MECHANISM IN A RECORDING AND REPRODUCING APPARATUS

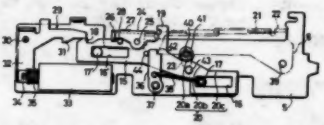
Masao Okita, Furukawa; Kunihiko Gunji, Miyagi, and Yukio Saito, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 23, 1984, Ser. No. 633,141

Claims priority, application Japan, Jul. 21, 1983, 58-112239[U]

Int. Cl.⁴ G11B *5/016, 17/04*

U.S. Cl. 360—97 **2 Claims**



1. In a recording and reproducing apparatus for a disk cartridge comprising:

(a) means including a cartridge holder adapted to hold a disk cartridge for movement between a first position for moving said cartridge into and out of said apparatus and a second position in which a disk cartridge fully inserted in said cartridge holder is moved to engage a magnetic head in said apparatus, said cartridge holder having an insertion end disposed toward a forward end of said apparatus and a distal end disposed toward a rearward end of said apparatus;

(b) means including a load lever mounting said cartridge holder for moving said cartridge holder between said first and second positions;

(c) locking means engageable with said load lever for holding said cartridge holder in said first position prior to full insertion of said disk cartridge in said cartridge holder;

(d) means including a cam plate movable rearwardly by abutting engagement with a disk cartridge inserted in said cartridge holder of said apparatus;

(e) said cam plate having a member for moving said locking means to release said load lever when said cam plate is moved to its rearward position, thereby allowing said cartridge holder to move to said second position, and means for moving said cartridge holder from said second position back to said first position upon movement of said cam plate forwardly for ejection of said cartridge;

(f) wherein the improvement comprises a tension spring mounted between the load lever and the cam plate to bias the load lever toward the second position and at the same time to bias the cam plate forwardly.

4,641,212

APPARATUS FOR LOADING A MAGNETIC DISC AND FOR CONTROLLING THE DRIVING THEREOF

Yuji Yokota, and Akira Osabe, both of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Saitama, Japan

Filed Sep. 27, 1983, Ser. No. 536,255

Claims priority, application Japan, Oct. 1, 1982, 57-171053

Int. Cl.⁴ G11B *17/04*

U.S. Cl. 360—99 **10 Claims**

1. A magnetic disc unit having a magnetic head for recording or reproducing information on or from a magnetic disc having a center hub and being accommodated in a cassette, comprising:

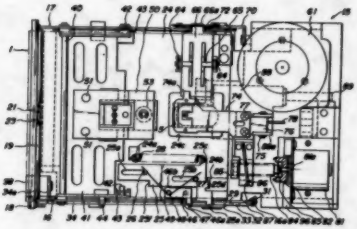
a cassette guide member for carrying said cassette in a manner such that said cassette guide member moves said cas-

sette to a predetermined position in the insertion direction of said cassette in accordance with the insertion of said cassette and for guiding said cassette to a recording/reproducing position at which information is recorded or reproduced on or from said magnetic disc;

a spindle for rotating said magnetic disc;

a hub holding member for pushing said center hub of said magnetic disc to said spindle to hold said magnetic disc between said spindle and said hub holding member;

a transmitting member having



a first portion for moving said cassette guide member to said recording/reproducing position, and

a second portion for moving said hub holding member to said spindle, the displacement of said second portion being larger than that of said first portion; and

a driving member for driving said transmitting member such to move said transmitting member in a manner that said cassette guide member is positioned to said recording/reproducing position, when said cassette guide member reaches said predetermined position.

4,641,213

MAGNETIC HEAD

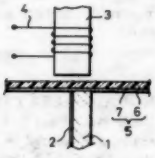
Yutaka Shimada, Sendai; Takashi Hatanai; Koichi Mukasa, both of Koide, and Keishi Nakashima, Yunotani, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jul. 16, 1984, Ser. No. 630,900

Claims priority, application Japan, Jul. 16, 1983, 58-128721; Jul. 16, 1983, 58-128724; Jul. 16, 1983, 58-128715

Int. Cl.[4] G11B *5/12, 5/22*

U.S. Cl. 360—125 **3 Claims**



1. A magnetic head for perpendicular magnetic recording for magnetizing in the thickness direction of a magnetic layer of a magnetic recording medium by disposing the principal magnetic pole of the magnetic head facing a surface of the magnetic layer, wherein said principal magnetic pole is composed of a cobalt-based ternary amorphous alloy containing small amounts of hafnium and tantalum, wherein the content of hafnium is from 1 atom% to 5 atom% and the content of tantalum is from 4 to 10 atom%.

4,641,214

ROTARY HEAD ASSEMBLY WITH PUMP-OUT TYPE SPIRAL GROOVES FOR MORE STABLE TAPE RUNNING

Kiyokazu Imanishi; Hiroyuki Naka, both of Osaka; Yasuo Sakurai, Neyagawa; Takashi Ichiyanagi, Hirakata, and Masaru Kishimoto, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

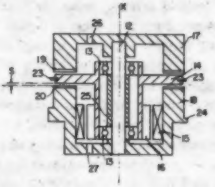
PCT No. PCT/JP83/00270, § 371 Date Apr. 20, 1984, § 102(e) Date Apr. 20, 1984

PCT Filed Aug. 18, 1983, Ser. No. 606,436

Claims priority, application Japan, Aug. 20, 1982, 57-145023

Int. Cl.[4] G11B *15/60, 5/027*

U.S. Cl. 360—130.24 **6 Claims**



1. A rotary head assembly comprising:

a shaft having a central axis extending in an axial direction;

an upper stationary cylinder fixedly attached to an upper end of said shaft, said upper cylinder having a lower axial end surface spaced radially from said central axis, said lower axial end surface having pump-out type spiral grooves thereon;

a lower stationary cylinder fixedly attached to a lower portion of said shaft, said lower cylinder having an upper axial end surface spaced radially from said central axis and being coaxial with said lower axial end surface of said upper cylinder, said upper axial end surface having pump-out type spiral grooves thereon;

a rotary member rotatably supported on said shaft between said upper cylinder and said lower cylinder, said rotary member having a portion thereof extending between said axial end surfaces of said upper and lower cylinders, said portion having an upper surface which is spaced from said lower axial end surface of said upper cylinder by a minute clearance and a lower surface which is spaced from said upper axial end surface of said lower cylinder by a minute clearance;

at least one magnetic head mounted on a radially outer surface of said portion of said rotary member, said at least one magnetic head protruding outward from a radially outer surface of said upper cylinder and a radially outer surface of said lower cylinder, said radially outer surfaces of said upper and lower cylinders being nearly equal in diameter; and

means for rotating said rotary member.

4,641,215

EXPOSURE CONTROL DEVICE FOR ELECTRONIC PHOTOGRAPHING APPARATUS

Akira Katoh; Masatoshi Ida; Kouichi Shijima; Makoto Oishi; Akihiko Hashimoto, and Shinya Takahashi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,126

Claims priority, application Japan, Mar. 10, 1982, 57-37375

Int. Cl.[4] H04N *5/78, 9/491*

U.S. Cl. 360—35.1 **1 Claim**

1. An electronic photographing system comprising:

an objective lens system for receiving incident light from an object;

first solid state image sensor means for receiving said incident light through said objective lens system for produc-

ing an image signal usable to measure an exposure, and also usable to form a television image signal;

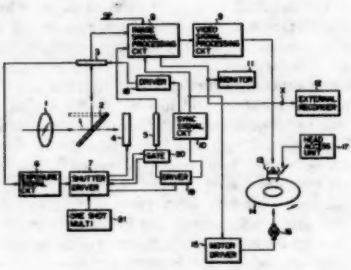
second solid state image sensor means for receiving said incident light through said objective lens system for producing an image signal for still picture recording;

shutter means for blocking the incident light to said second solid state image sensor means at a predetermined timing;

first driving means for driving said first solid state image sensor means so as to enable said first solid state image sensor means to issue the image signal;

second driving means for driving said second solid state image sensor means and including means for generating a plurality of driving pulses including a first driving pulse for reading out an image signal corresponding to a first field and a second driving pulse for reading out an image signal corresponding to a second field;

shutter driving means for driving said shutter means for controlling an exposure time during which said second solid state image sensor means responds to the image signal issued from said first solid state image sensor means, said shutter driving means including an exposure control signal generator means for providing an exposure signal to determine a proper exposure time on the basis of an output signal from said first image sensor means, and said shutter driving means providing a shutter drive pulse based on



said exposure control signal in synchronism with said second driving pulse, said shutter drive pulse having a pulse width corresponding to the exposure time;

gate circuit means for controlling passage of said first and second driving pulse to said second solid state image sensor means so as to inhibit said first and second driving pulses while said shutter drive pulse is present and also to inhibit said second driving pulse anticipant of said first driving pulse immediately after extinction of the shutter drive pulse;

synchronizing signal generator means for generating pulses including first synchronizing pulses and second synchronizing pulses respectively supplied to said first driving means and to said second driving means;

recording means responsive to operation of a shutter release for recording an image data signal on a recording medium, said image date signal corresponding to the image signal issued from a selected one of said first solid state image sensor means and said second solid state image sensor means; and

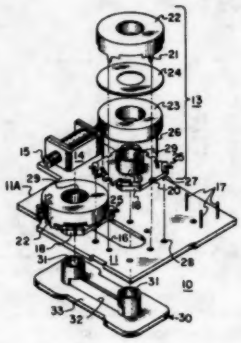
means coupled to said synchronizing signal generator means for driving said recording medium in synchronism with the operation of at least one of said first driving means and said second driving means under synchronization control based on an output from said synchronizing signal generator means.

4,641,216

SIGNAL PROCESSOR MODULE FOR GROUND FAULT CIRCUIT BREAKER

Robert A. Morris, Burlington, and Paul T. Rajotte, Plainville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,610
Int. Cl.[4] H05K 1/11
U.S. Cl. 361—45 **7 Claims**



1. A ground fault circuit breaker signal processor module comprising:

printed circuit board means containing electric signal processor circuit components on one surface and electrically conductive pins extending through said printed circuit board to an opposite surface for providing electrical connection between said signal processor components and an external circuit;

an apertured neutral excitation current transformer and an apertured differential current transformer spaced apart and arranged side by side on said opposite surface for sensing current through said external circuit;

solenoid means on said opposite surface for responding to electric signals generated within said signal processor circuit upon the occurrence of ground fault current through said external circuit; and

means on said printed circuit board defining an opening for providing electrical acess to said neutral excitation and said differential current transformers;

said neutral excitation and differential current transformers being arranged over said opening and a connecting strap being arranged under said opening whereby a first pair of electrically conductive extensions on said connecting strap extend through said opening and at least partially through said neutral excitation and differential current transformer apertures.

4,641,217

TWO POLE GROUND FAULT CIRCUIT BREAKER

Robert A. Morris, Burlington; Paul T. Rajotte; Ronald R. Russell, both of Plainville, and George W. Kiesel, Burlington, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 31, 1985, Ser. No. 739,810
Int. Cl.[4] H02H 3/28; H01H 73/06
U.S. Cl. 361—45 **6 Claims**

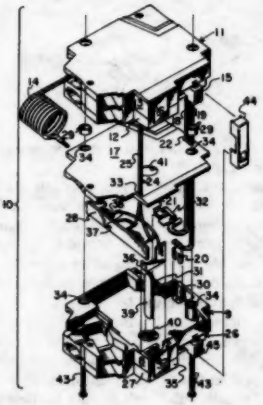
1. A two pole ground fault circuit breaker comprising:

a first pole circuit breaker with a first molded case and operatively connected with a ground fault circuit module within a second molded case;

a second pole circuit breaker within a third molded case operatively connected with both said ground fault module and said first pole circuit breaker; and

a power supply circuit within a fourth molded case electrically connected with both said first and second pole circuit breakers and said ground fault module for supplying operating power to said ground module from either of said first or second pole circuit breakers;

said power supply circuit comprising the parallel combination of a first diode and varistor connecting between said first pole circuit breaker and said ground fault circuit interrupter for providing first DC operating power to said ground fault module and the parallel combination of a second diode and varistor connecting between said second pole circuit breaker and said ground fault module for



providing second DC operating power to said ground fault module, said power supply and said ground fault module being electrically interconnected by means of a second pair of insulated wire conductors, first ends of said first and second conductors being electrically connected to pins on a printed wire board supporting said power supply circuit, said power supply case comprising means for retaining said printed wire board such that a bottom edge of said printed wire board is perpendicular to a bottom surface of said power supply case and said first diode and varistor are mounted on said printed wire board parallel to said bottom surface.

4,641,218

PROTECTOR WITH CIRCUIT DISABLER

Michael Scalera, Randolph, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 712,246, Mar. 15, 1985, abandoned. This application Jun. 21, 1985, Ser. No. 747,394

Int. Cl.[4] H02H 3/22

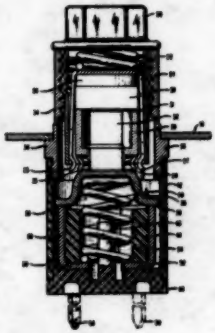
U.S. Cl. 361—119 **16 Claims**

1. A protector module which protects telecommunications equipment from damage caused by spurious voltages or currents said module comprising

an electrically conductive grounding barrel capable of being housed within one of a plurality of receptacles of a grounding chassis, said grounding barrel having a first internally threaded end and a second smooth surfaced end,

a protector unit having a threaded outer surface mating with said first end of said grounding barrel, and

means for grounding a conductor of a circuit when said protector unit is removed from said grounding barrel, said grounding means mating with said second smooth surfaced end of siad grounding barrel, one end of said circuit being connected to said telecommunications equipment



and the other end of said circuit being connected to a telephone central office.

4,641,219

LOW NOISE SOLENOID DRIVE

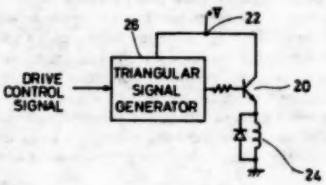
Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 9, 1984, Ser. No. 628,716

Claims priority, application Japan, Jul. 12, 1983, 58-127393

Int. Cl.[4] H01H 47/32

U.S. Cl. 361—153 **3 Claims**



1. A solenoid drive system comprising:

a solenoid coil;

transistor means connected to one end of said solenoid coil;

a driver circuit which controls the operation of said transistor means,

said driver circuit including a triangular signal generator connected to said transistor means for applying a triangular drive signal to an input of said transistor means;

plunger means activated by a force developed in said solenoid coil, said force being directly proportional to said triangular drive signal;

a load connected to one end of said plunger means,

wherein said plunger means moves said load from an initial position to an operating position upon activation by the force developed in said solenoid coil,

said initial position corresponding to one point on an increasing slope of said triangular drive signal and said operating position corresponding to another point on said increasing slope,

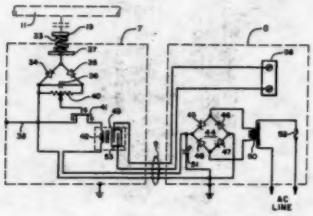
such that the distance between said one point and said another point, corresponds to the excess force on said load at said operating position, and is minimized.

4,641,220

TEST POINT MOUNTED VOLTAGE MONITORING SYSTEM

Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill. 60062

Filed Sep. 21, 1984, Ser. No. 653,492
Int. Cl.[4] G01R 19/14
U.S. Cl. 361—187 15 Claims



1. A voltage monitoring system for providing an output indicative of the voltage level of a monitored high voltage conductor in an alternating current power distribution system falling below a predetermined minimum level, comprising:

a capacitor;

rectifier circuit means for capacitively coupling said capacitor to the conductor whereby said rectifier means develop a direct current sensing voltage on said capacitor dependent on the alternating current voltage level on the conductor;

a switching device having principal electrodes and a control electrode, conduction between said principal electrodes being established upon the application of a sensing voltage above a predetermined threshold level to said control electrode;

coupling circuit means for applying a predetermined portion of said sensing voltage to said control electrode whereby said predetermined threshold level is exceeded and conduction occurs between said principal electrodes upon the voltage level in the monitored conductor exceeding the predetermined minimum level; and

output circuit means including the principal electrodes of said switch device for providing a control effect indicative of the voltage falling below the predetermined minimum level.

4,641,221

THIN TAPE FOR DIELECTRIC MATERIALS

Issam A. Khoury, Southboro; Robert H. Heistand, II, East Walpole, and Iwao Kohatsu, Lexington, all of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1985, Ser. No. 761,929
Int. Cl.[4] H01G 4/10; H01B 3/12
U.S. Cl. 361—321 20 Claims

15. A capacitor prepared using a green tape, the slip comprising:

(a) a dielectric component;

(b) a binder;

(c) a solvent; and optionally,

(d) a plasticizer; and, optionally,

(e) a surfactant or wetting agent,

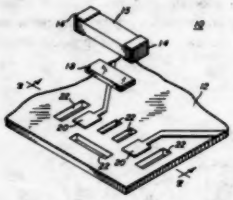
the improvement comprising the use of a binder comprising an ethylcellulose having an ethoxyl content of from about 48 to about 49.5 weight percent, and a viscosity of from about 30 to about 60 cps, the viscosity being that of a 5 weight percent solution measured at 25° C. in an Ubbelohde viscometer with a solvent which is 80 weight percent toluene and 20 weight percent ethanol.

4,641,222

MOUNTING SYSTEM FOR STRESS RELIEF IN SURFACE MOUNTED COMPONENTS

Dennis J. Derfiny, Clarendon Hills; Anthony P. van den Heuvel, Arlington Heights, and Nihat S. Edguer, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 29, 1984, Ser. No. 614,366
Int. Cl.[4] H05K 1/18
U.S. Cl. 361—403 11 Claims



1. A system for stress relief in surface mounted components, said system comprising:

(a) a mounting substrate having a conductive pattern with mounting areas deposited thereon and further having zones removed, wherein said zones are substantially the same size or larger than said mounting areas, said zones being disposed immediately adjacent or peripheral to said mounting areas of said conductive pattern, for relieving stress within said mounting substrate;

(b) a leadless componenet having ends for attaching to said leadless component component; and

(c) a spacing element, disposed between said mounting substrate and said leadless component; and

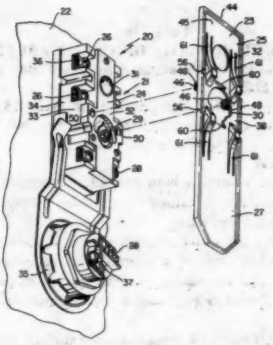
(d) means for bonding the ends of said leadless component and said spacing element to said mounting substrate.

4,641,223

PROTECTIVE SHIELD FOR EXTERNAL PARTS OF A CONTROL ARRANGEMENT

Harold A. McIntosh, Crestline, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 627,047, Jul. 2, 1984, Pat. No. 4,554,616.
This application Aug. 30, 1985, Ser. No. 771,102
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] H02B 1/04
U.S. Cl. 361—424 4 Claims



1. In a combination of a control arrangement having housing means provided with certain external electrical means and a one-piece protective shield carried by said housing means and having an end section thereof covering said certain external

electrical means, the improvement wherein said section of said protective shield is movable relative to the remainder of said shield between a first position thereof that covers said certain external electrical means and a second position thereof that uncovers said certain external electrical means, said protective shield being substantially flat when said section is in said first position thereof, said section of said protective shield being substantially transverse to said remainder of said shield when said section is in said second position thereof whereby said protective shield is substantially L-shaped when said section is in said second position thereof, said protective shield having hinge means that hinge said section to said remainder of said protective shield, said hinge means having means that holds said section in said first position thereof when said section is moved to said first position thereof and that holds said section in said second position thereof when said section is moved to said second position thereof.

4,641,224

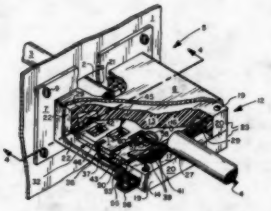
ELECTROMAGNETIC INTERFERENCE REDUCING ASSEMBLY

William A. Reimer, Wheaton, Ill., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Filed Jul. 25, 1985, Ser. No. 758,901

Int. Cl.⁴ H05K *9/00*

U.S. Cl. 361—424 **20 Claims**



1. An assembly to prevent electromagnetic interference generated by equipment within an enclosure from passing out of said enclosure on a cable, including a plurality of electrical conductors connected to said equipment and passing from within to outside of said enclosure, said assembly comprising;

a support means of nonelectrically conductive construction and including at least a first surface;

at least one conductive layer formed on said first surface;

a plurality of electromagnetic interference reducing means, each including a first terminal connected to said conductive layer and a second terminal connected to a different one of said electrical conductors; and

an electrically conductive housing removably containing therein said support means, said conductive layer and said interference reducing means, said housing electrically connected to said conductive layer and to said enclosure.

4,641,225

DISTRIBUTOR FRAME FOR LOW-CURRENT ELECTRICAL CIRCUITS FORMED FROM CHANNELS

Hans Reichle, Wetzikon, Switzerland, assignor to Reichle & De Massari AG Elektro-Ingenieure, Wetzikon, Switzerland

Filed Aug. 24, 1984, Ser. No. 644,324

Claims priority, application Switzerland, Sep. 5, 1983, 4849/83

Int. Cl.⁴ H02B *1/02*; H04Q *1/14*

U.S. Cl. 361—429 **8 Claims**

1. An electrical current distribution frame, comprising:

a plurality of laterally interconnected channels each having a rear wall, a pair of lateral walls, a pair of front walls extending from said lateral walls toward one another and defining a frontwardly open slot between them, said front walls being parallel to said rear wall, respective inwardly extending mutually parallel wall sections connected to said front walls flanking said slot, and respective flanges connected to said wall sections and diverging from one another toward said rear wall, said flanges having longitudinal edges;

respective horizontal slots formed on said front walls of each channel for receiving connection hooks of circuit units to be mounted on said frame;

respective bores formed on the remaining walls of each channel for interconnection of said channels laterally; and

respective cable ridges mounted on each of said longitudinal edges of each channel, disposed in the respective channel and formed with spaced-apart tongues for retaining conductors passed therebetween.

4,641,226

REFLECTOR FOR LINEAR LIGHT SOURCES

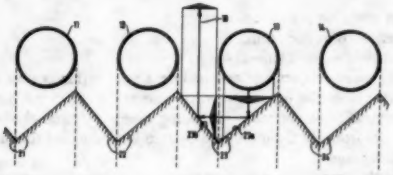
Walter Kratz, Zum Schloesschen 4, D-5208 Eitorf-Muehleip, Fed. Rep. of Germany

Continuation of Ser. No. 423,747, Sep. 27, 1982, abandoned. This application Aug. 28, 1985, Ser. No. 770,361

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142267

Int. Cl.⁴ F21S *3/00*; F21V *7/00*

U.S. Cl. 362—218 **19 Claims**



1. In an array of linear light sources including a plurality of tubular light sources placed in a parallel, equally spaced-apart relationship with respect to one another and extending in a plane perpendicular to a main radiation exit direction of said array, an integral reflector panel for use adjacent to said array and spaced apart therefrom to thereby achieve a high radiant efficiency in the main radiation exit direction, said panel having a sawtooth-shaped cross-section and comprising:

a plurality of reflectors corresponding in number to the number of said plurality of tubular light sources, each reflector having angularly disposed first and second rectangular sheets including long edges and short edges and being connected along adjacent long edges thereof, adjacent reflectors being joined along adjacent long edges thereof to thereby form the sawtooth-shaped cross-section of the integral reflector panel, wherein the angularly disposed first and second sheets of each reflector each have a slope, provided that the slope of the first sheet is less than the slope of the second sheet, and wherein each

second sheet includes with the main radiation exit direction an angle of 20° to 40°,

wherein projection lines drawn parallel to the main radiation exit direction from the extremities of the short edges of each of the first sheets onto a plane through the centers of the plurality of light sources define a projected length which is substantially equal to the diameter of one light source and which is coincident with the extremities of the diameter of the light source, and

wherein projection lines drawn parallel to the main radiation exit direction from the extremities of the short edges of each of the second sheets onto a plane through the centers of the plurality of light sources define a projected length which is substantially equal to the spacing between the extremities of adjacent light sources and which is coincident therewith.

4,641,227

SOLAR SIMULATOR

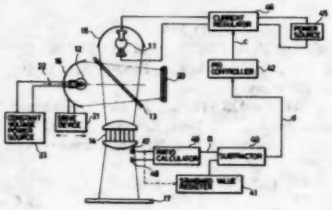
Masaki Kusuhara, Tokyo, Japan, assignor to Wacom Co., Ltd., Japan

Filed Aug. 15, 1985, Ser. No. 766,124

Claims priority, application Japan, Nov. 29, 1984, 59-252698; May 24, 1985, 60-110542

Int. Cl.⁴ F21V *9/00*

U.S. Cl. 362—231 **15 Claims**



1. A solar simulator, comprising

a xenon short arc lamp,

an incandescent filament lamp,

filter means capable of eliminating a near infrared component from the light emitted by said xenon short arc lamp and, at the same time, extracting a near infrared component from the light emitted by said incandescent filament lamp, and

a single integrating optical system on which the light emitted by said xenon short arc lamp minus said near infrared component and the light of said near infrared component extracted by said filter means from the light emitted by said incandescent filament lamp impinge.

4,641,228

LAMP MOUNTING APPARATUS AND METHOD

Rhett McNair, Anaheim, Calif., assignor to Scientific Component Systems, Inc., Anaheim, Calif.

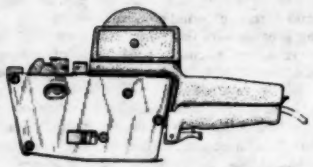
Filed Aug. 29, 1984, Ser. No. 645,288

Int. Cl.⁴ F21V *19/00*

U.S. Cl. 362—382 **12 Claims**

1. Lamp mounting apparatus comprising:

connection means having elongated means connected to a electrical connector means and extending downward through opening means in a reflector means, gripper means connected to the elongated means and slideable along the elongated means in an upward direction toward the electrical connector means for gripping the elongated means and pulling the reflector means upward toward the



electrical connector means as the gripper means is slid upward along the elongated means.

4,641,229

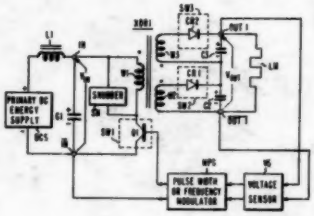
SWITCHING DC-TO-DC CONVERTERS

Finis C. Easter, Mount Laurel, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 245,103, Mar. 18, 1981. This application Sep. 2, 1982, Ser. No. 414,481

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—21 **22 Claims**



1. A switching dc-to-dc converter comprising:

first and second input terminals for connecting a primary dc energy supply between;

first and second output terminals for connecting a load between;

transformer means having at least first and second windings, its windings being continuously transformer-coupled to each other;

first switch means for connecting the first winding of said transformer means in a path for input current flow between said first and second input terminals during a first series of time intervals and for disconnecting the first winding from said path during a second series of time intervals interleaved in time with said first series of time intervals;

first and second capacitors having first and second capacitances respectively between their first and second plates, the first plate of said first capacitor being connected to said first output terminal, the first plate of said second capacitor being connected to said second ouput terminal, and the second plates of said first and second capacitors being interconnected at a first node, the ratio of said first capacitance to said second capacitance being equal to a nominal value of the ratio of the durations of time intervals in said first series to the durations of time intervals in said second series, for reducing output voltage ripple between said first and second output terminals;

means applying transformed input current from said second winding of said transformer means to said first capacitor for charging said first capacitor during each of said first series of time intervals; and

means applying flyback current from one of the windings of said transformer means to said second capacitor for charg-

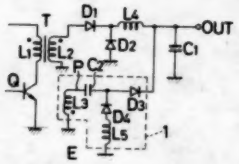
ing said second capacitor during each of said second series of time intervals.

4,641,230

PULSE ABSORPTION CIRCUIT FOR POWER SOURCE CIRCUIT

Sinji Kudo, Yokohama, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,638
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 2 Claims



1. A pulse absorption circuit for a switching power source circuit for supplying or cutting off an input current at a primary winding of a transformer upon ON/OFF operation of a switching element, comprising:

a rectifying circuit having an output terminal, said rectifying circuit including a diode and a smoothing capacitor operatively coupled at a secondary winding side of said transformer for smoothing and rectifying an output of the secondary winding;

a second capacitor, one end of which is connected to a secondary winding output terminal of the transformer in a phase opposite to a primary winding input terminal thereof;

a first rectifying element, an anode of which is connected to the other end of said second capacitor and a cathode of which is connected to said output terminal of said rectifying circuit;

a second rectifying element, a cathode of which is connected to a junction between said first rectifying element and said second capacitor; and

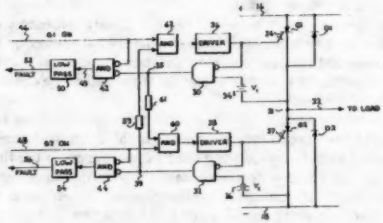
a conductor inserted between a ground terminal and said second rectifying element.

4,641,231

APPARATUS AND METHOD FOR FAILURE TESTING OF A CONTROL TURN-OFF SEMICONDUCTOR

Loren H. Walker, Salem, and Georges R. E. Lezan, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 6, 1985, Ser. No. 805,646
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—58 24 Claims



1. A method of determining the conductive state of a control turn-off semiconductor of the type having an anode, a cathode and a control electrode to which signals are applied to control the conducting state of the semiconductor comprising the steps:

(a) generating a control electrode voltage signal representing the extant voltage at said control electrode; and,

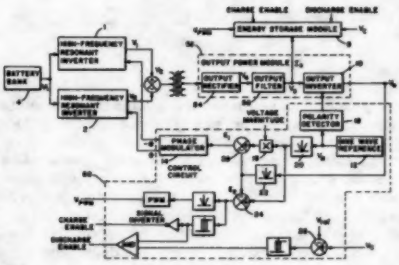
(b) combining said control electrode signal with a reference voltage signal of predetermined value to develop output signals representing the operational state of said semiconductor.

4,641,232

ELECTRICAL POWER INVERTER HAVING A PHASE MODULATED, TWIN-INVERTER, HIGH FREQUENCY LINK AND AN ENERGY STORAGE MODULE

Ira J. Pitel, Whippany, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 23, 1985, Ser. No. 693,955
Int. Cl.[4] H02P 13/20
U.S. Cl. 363—71 13 Claims



1. An electrical power inverter apparatus, which includes a high frequency link, for converting DC power to AC power, comprising:

(a) a first high frequency inverter module which produces a first AC voltage at a first output frequency;

(b) a second high frequency inverter module which produces a second AC voltage at a second output frequency, which is substantially the same as said first output frequency and is out of phase with said first output voltage by a selected angular phase displacement;

(c) mixing means for mixing said first and second output voltages to produce a high frequency carrier which has a selected base frequency impressed on the sidebands thereof;

(d) rectifying means for rectifying said carrier;

(e) filtering means for filtering the rectified carrier;

(f) output inverting means for inverting the filtered carrier to produce an AC line voltage at said selected base frequency; and

(g) phase modulating means for adjusting the relative angular phase displacement between the outputs of said first and second high frequency inverter modules to control the base frequency of said AC line voltage.

4,641,233

AC TO DC CONVERTER WITH VOLTAGE REGULATION

Richard D. Roy, Schererville, Ind., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 3, 1985, Ser. No. 730,009
Int. Cl.[4] H02M 7/06
U.S. Cl. 363—89 3 Claims

1. An arrangement for converting AC input power to DC output power at a reference voltage, comprising:

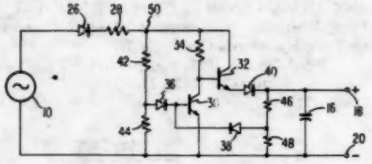
a capacitor;

rectifying means for rectifying said AC input power;

controllable switching means coupled between the output of

said rectifying means and said capacitor for supplying current to charge said capacitor including a first transistor arranged with its collector and emitter in a current carrying path between said rectifying means and said capacitor and a second transistor coupled to the base of said first transistor;

first means responsive to the rectifying means output voltage being above a predetermined threshold for preventing said switching means from supplying said current, including a first voltage divider connected across the output of said rectifying means and having first and second resistors connected in series, and first coupling means for coupling the junction of said first and second resistors in said first voltage divider to the base of said second transistor; and



second means responsive to the voltage across said capacitor being greater than said reference voltage for preventing said switching means from supplying said current, including a second voltage divider connected across said capacitor and having third and fourth resistors connected in series, and second coupling means for coupling the junction of said third and fourth resistors in said second voltage divider to the base of said second transistor, and

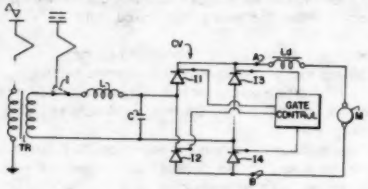
wherein said first and second coupling means together form an OR circuit consisting of a respective diode having its anode connected to the respective resistor junction and its cathode connected to said second transistor base.

4,641,234

A-C OR D-C TO D-C CONVERTER FOR DUAL CURRENT LOCOMOTIVES WITH D-C MOTORS

Jean Bonal, Melun, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed Dec. 10, 1984, Ser. No. 679,753
Claims priority, application France, Dec. 13, 1983, 83 19899
Int. Cl.[4] H02M 9/00
U.S. Cl. 363—124 **8 Claims**



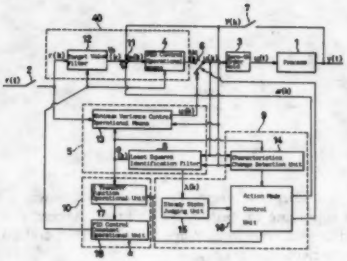
1. A power unit for supplying a D-C load from either an A-C or a D-C source, comprising a bridge circuit having two input terminals and two output terminals and four branches each including a unidirectional semiconductor device, the respective semiconductor devices of said branches being connected in such a manner as to permit current flow in only one direction through said output terminals, at least two of said semiconductor devices being of the gate-controlled turn-off type; switching means connected to said input terminals for switching said terminals selectively between an A-C supply and a D-C supply; and gate control means for providing control signals to the gates of said gate-controlled turn-off devices to operate said bridge circuit in a chopper mode when said input terminals are supplied with D-C and in a rectifier mode when said input terminals are supplied with A-C.

4,641,235

PROCESS CONTROL APPARATUS WITH PROCESS DEPENDENT SWITCHING BETWEEN PROCESS CONTROL MODES

Takashi Shigemasa, and Yoshinori Ichikawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1984, Ser. No. 653,908
Claims priority, application Japan, Sep. 26, 1983, 58-176434
Int. Cl.[4] G05B 13/04
U.S. Cl. 364—149 **16 Claims**



1. A process control apparatus which comprises:

a. first process control operational means (40) adapted to control a process in a first control mode by producing a first control signal $u(k)=u_o(k)$ when the characteristics of the process to be controlled are in a steady state;

b. second process control operational means (5) including first control operational means (13) and least square identification means (8), adapted to control the process in a second control mode by producing a second control signal $u(k)=u_1(k)$ when the characteristics of the process change rapidly;

c. first detection means (15) for detecting the steady state of the characteristics of the process in accordance with a predetermined factor from said least square identification means and for producing a first detection signal therefrom;

d. second detection means (14) for detecting rapid changes in the characteristics of the process in accordance with a process output signal y(k), a control signal u(k) from and to the process, and an identification signal $\theta(k)$ from said least square identification means and for producing a second detection signal therefrom;

e. a mode control unit (16) responsive to one of the first detection signal and the second detection signal, for producing a dynamic characteristic change confirmation signal $\Delta r(k)$ and a change-over signal, or an operation execution command signal in accordance with the first or second detection signal;

f. change-over switch means (6) selectively switched to either said first process control operational means or to said second process control operational means in accordance with the change-over signal from said mode control unit means; and

g. a control constant operation unit (18) responsive to the operational execution command signal from said mode control unit, for calculating control parameters in the first control mode in accordance with the identification signal $\theta(k)$ from the least square identification means so as to produce the first control signal $u_o(k)$, whereby said switch means is changed-over to the second process control operational means when the characteristics of the process are detected to be frequently changing while it is changed-

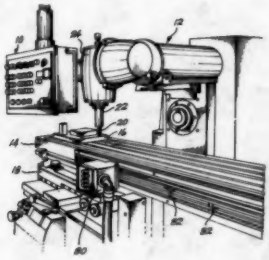
over to the first process control operational means when the characteristics of the process are detected to be in the steady state.

4,641,236

PROGRAMMABLE MACHINE TOOL CONTROL SYSTEM

John R. Brooks, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 6, 1985, Ser. No. 731,291
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—171 **10 Claims**



1. A method for the "open loop" control of a machine whose functions are operated by a microprocessor, comprising the following steps:

preprogramming said microprocessor to operate said machine in accordance with an operator control program entered by a machine operator;

providing motion limiter means for setting certain positions at which machine movement is to be limited;

providing a control panel having a plurality of machine function controls corresponding to desired machine functions which a machine operator may want said machine to perform, wherein such functions may include certain machine movements and certain work operations;

using said control panel to enter said operator control program into said microprocessor, including performing the following steps in sequence:

(1) activating at least some of said controls on said control panel corresponding to certain machine functions which said operator wants performed by said machine;

(2) displaying on said control panel said activated controls;

(3) entering into said microprocessor the machine functions corresponding to said activated controls, such entry being one step of said operator control program; and

(4) sequentially entering additional steps of said program in the manner set forth in steps 1–3, and after said steps are entered;

running said operator control program, wherein said microprocessor executes the steps of said control program, said microprocessor executing a step that includes a movement function by moving said machine in the direction commanded during such step, said microprocessor being responsive to said motion limiter means to limit motion of said machine in accordance with position limits set by said motion limiter means, and with said microprocessor executing a step that includes a work operation function by causing said machine to perform said work operation during such step, and continuing to cause said machine to perform such work operation until such work operation is cancelled in another step of said control program; and

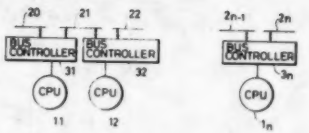
displaying each step on said control panel while it is being executed by said microprocessor.

4,641,237

BUS CONTROL METHOD AND APPARATUS

Masaharu Yaboshita, Sagamihara; Makoto Nohmi, Kawasaki; Nobuyuki Fujikura, Kawasaki; Shoji Miyamoto, Kawasaki, and Hirokazu Ihara, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,078
Claims priority, application Japan, Sep. 7, 1982, 57-156143
Int. Cl.[4] G06F *13/14, 13/40*
U.S. Cl. 364—200 **6 Claims**



1. A method of configuring and operating a processor communication bus by way of which a plurality of processors communicate with one another comprising the steps of:

providing a cluster communications bus in the form of a plurality of successive bus segments, each respective bus segment being disposed between successively adjacent ones of said plurality of processors;

providing a respective bus controller between successively adjacent ones of said bus segments, each respective bus controller intercoupling succesively adjacent ones of said bus segment and being coupled to a respective one of said plurality of processors;

in response to one of said processors desiring to transfer data by way of said cluster communications bus, supplying to said cluster bus a send request and priority processing level signal; and

relaying, along the cluster bus in a downward direction from a bus controller associated with a processor in a data transfer mode, via each bus controller associated with a processor not in a data transfer mode, first bus control signals generated by a logical OR operation between said request signal relayed from a processor and a send request signal to be relayed from the next processor in the downward direction and between said level signal relayed from said processor and said level signal to be relayed from said next processor in the downward direction; relaying, along the cluster bus in an upward direction to said bus controller associated with a prcoessor in a data transfer mode, via each bus controller associated with a processor not in a data transfer mode, a second bus control signal generated by a logical AND operation between a receipt acknowledge signal relayed from a processor and a receipt acknowledge signal to be relayed from the next processor in the upward direction, in response to receipt of a send request and priority processing level signal from a prcoessor, and effecting, at the same time, the transfer of data from said one processor, which has supplied a send request and priority processing level signal to the cluster bus and has received a request acknowledge signal therefrom to all other processors on said cluster bus via their respectively associated bus controllers.

4,641,238

MULTIPROCESSOR SYSTEM EMPLOYING DYNAMICALLY PROGRAMMABLE PROCESSING ELEMENTS CONTROLLED BY A MASTER PROCESSOR

Kristine N. Kneib, San Diego, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 10, 1984, Ser. No. 680,107
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **20 Claims**

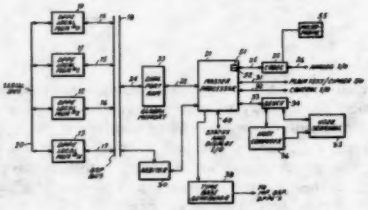
1. A multiple processor apparatus particularly adapted for

use in providing digital signals according to complicated algorithms, comprising:

a plurality of dynamically programmable processing elements (DPPE) means, each capable of processing input data in accordance with arithmetic computations to be performed on said data, and each having a bidirectional input/output port and a second bidirectional input/output port,

a first bus coupled between said input/output ports of said DPPE's for enabling transfer of data between each of said plurality of DPPE elements,

a second digital signal processing bus coupled to the second input/output ports of said plurality of DPPE element means,



global memory means having an input/output port coupled to said second bus, and a second input/output port

a master processor having a bidirectional input/output port coupled to said second input/output of said global memory for controlling the data to be transmitted via said memory means to said second bus and for receiving data from said second bus as processed by said DPPE's,

said master processor having a plurality of bidirectional input/output lines for selectively receiving or transmitting data and for controlling the status of said lines according to the arithmetic computations performed by said plurality of DPPE's.

4,641,239

AUTOMATIC-TRANSFER-TRANSACTION PROCESSING APPARATUS

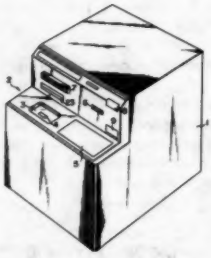
Sumiyoshi Takesako, Yamato, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 19, 1984, Ser. No. 673,088

Claims priority, application Japan, Nov. 17, 1983, 58-216714

Int. Cl.[4] G06F *15/30*

U.S. Cl. 364—408 **10 Claims**



1. An automatic-transfer-transaction processing apparatus comprising:

first means for receiving a transfer card on which at least the transferee and the limit data of the card are recorded and from which these pieces of data can be read by a device, and for reading these pieces of data;

second means for transferring a specified amount to the transferee which has been read from the card;

third means for determining, from the limit data, whether or not a new transfer card must be issued; and

fourth means for issuing a new card in accordance with the decision made by the third means.

4,641,240

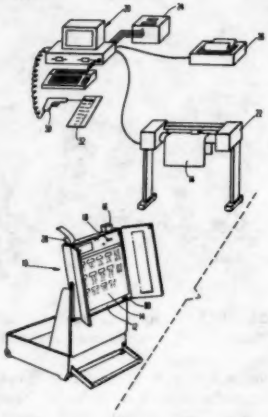
ELECTRONIC VOTING MACHINE AND SYSTEM

Robert J. Borsm, Quakertown, Pa., assignor to R. F. Shoup Corporation, Bryn Mawr, Pa.

Filed May 18, 1984, Ser. No. 608,157

Int. Cl.[4] G06F *15/20*; G07C *13/00*

U.S. Cl. 364—409 **21 Claims**



1. An electronic voting system for use by voters in casting their votes during an election, comprising:

a computer system for receiving input data relating to offices contested, candidates for said offices and legal restrictions on voting for said offices, and at least one programmable voting machine, said computer system comprising:

means for inputting said data;

means for storage and manipulation of said data;

means for generating a ballot associating said candidates with their respective offices and indicating any such legal restrictions on voting for said candidates;

means for generating control signals for supply to said voting machine, said signals including information concerning said candidates and their respective offices and any legal restrictions on their running as well as a first checksum based upon said data;

programmable read-only memory means including erasable read-only memory means for transporting said signals to said voting machine and for redundantly tabulating the votes cast on said voting machine;

means for altering data stored in said erasable, read-only memory means upon the voter's having completed casting his votes in order to update a total votes cast for each of said candidates, whereupon said voting machine is adapted to program said erasable read-only memory means with new data indicative of said total votes cast; and

means for generating a second checksum upon completion of the election, said second checksum based upon the total votes cast at the completion of the election and adapted to indicate an election security breach if said total votes cast does not agree with said second checksum;

said voting machine comprising:

an array of substantially identical switches, each of said

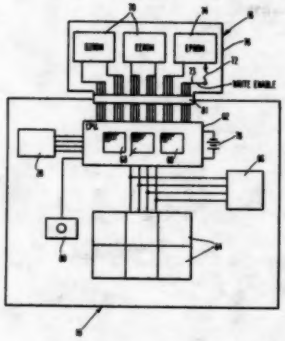
switches upon actuation thereof indicating a vote cast; and

means for effectively associating said switches with said candidates and with said offices upon supply to said voting machine of said control signals, such that on supply of said signals to said voting machine the voting machine is adapted from an unprogrammed state to a state in which it is programmed to redundantly record the results of a given election.

4,641,241
MEMORY CARTRIDGE FOR ELECTRONIC VOTING SYSTEM

Robert J. Boram, Quakertown, Pa., assignor to R. F. Shoup Corporation, Bryn Mawr, Pa.

Filed May 8, 1984, Ser. No. 608,159
Int. Cl.[4] G06F *15/20*; G07C *13/00*
U.S. Cl. 364—409 6 Claims



1. A programmable memory cartridge for use in connection with an electronic election system, said system comprising:

computer means for receiving data concerning candidates, their respective offices and legal restrictions on voting therefor; and

programmable voting machine means, said programmable voting machine means being programmed by supply thereto of said memory cartridge;

said programmable memory cartridge comprising solid state memory data storage means and being adapted to be electrically connected to said computer means for receipt and storage of data and adapted to be connected to said programmable voting machine means for supply of said data thereto so as to program said programmable voting machine means;

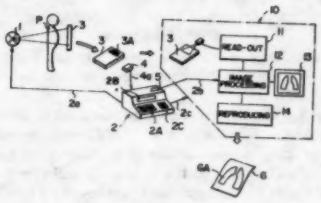
wherein said solid state memory data storage means comprises means for storage of data received from said computer means for supply to said programmable voting machine means, for adapting said programmable voting machine means for use in connection with a particular election, means for storage of election results received from said programmable voting machine means and supply thereof to said computer means for tabulation of the results of the election and means for storing running totals of the votes tallied in connection with a given election, in addition to memory means for storage of the final results output by said voting machine upon conclusion of an election;

wherein said running totals are stored in an electrically erasable read only memory and the final results of said election are stored in a non-electrically erasable read only memory.

4,641,242
RADIATION IMAGE RECORDING AND REPRODUCING SYSTEM

Tsutomu Kimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1984, Ser. No. 587,717
Claims priority, application Japan, Mar. 11, 1983, 58-40508
Int. Cl.[4] G01J *1/29*
U.S. Cl. 364—414 6 Claims



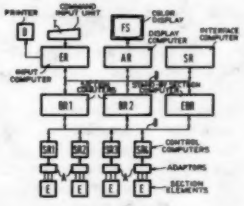
1. In a radiation image recording and reproducing system wherein a radiation is caused to pass through an object, said system including means for exposing a stimulable phosphor to said radiation passing through said object whereby a radiation image of said object is stored in said stimulable phosphor, means for exposing said stimulable phosphor to stimulating rays to photoelectrically read out said radiation image stored in said stimulable phosphor and obtain an electric image signal, means for subjecting said electric image signal to image processing according to the type of image reecording, and means for reproducing a visible image in accordance with said processed electric image signal,

the improvement comprising: means for adjusting the conditions of exposure to said radiation and the processing conditions of said image processing, including means for selecting in a single action the setting conditions predetermined according to the type of image recording.

4,641,243
COMPUTER-CONTROLLED INTERLOCKING SYSTEM FOR A RAILWAY INSTALLATION

Hans O. Hartkopf, Braunschweig, and Adalbert Zillmer, Wolfenbuettel, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,530
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323269
Int. Cl.[4] B61L *21/00*; G06F *15/48*
U.S. Cl. 364—436 4 Claims



1. A computer-controlled interlocking system for a railway installation which comprises a plurality of sections each of which has an associated plurality of roadway elements, said interlocking system comprising:

a plurality of section computers for respective association with said sections, including means for fail-safe operations;

each section computer connected to the associated roadway elements and comprising a respective program memory which is provided with programs relating to the processing of requirements for control, both individual and in relation to routes, of all the associated plurality of roadway elements independently of their presence and arrangement in the relevant section;

each section computer also comprising a write/read memory for receiving and storing data relating to the railway installation topography and for receiving and storing data relating to the individual roadway elements in terms of element type, element program, element designation and the arrangement of the elements relative to neighboring elements; and

an input computer connected in common to all the section computers, including means for fail-safe operations, said input computer including a read-only memory for storing said data relating to the railway installation topography and the individual roadway elements and to trasnfer said data to said write/read memories of the section computers during a loading phase which precedes operation of the system.

4,641,244

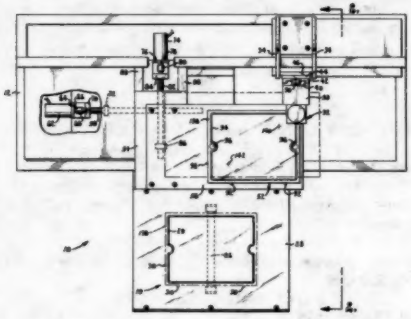
METHOD AND APPARATUS FOR REGISTERING COLOR SEPARATION FILM

Monti R. Wilson, Overland Park, Kans.; Victor E. Hutchison; William J. Bendure, both of Kansas City, Mo., and Frederick W. Anderson, Olathe, Kans., assignors to Opti-Copy, Inc., Lenexa, Kans.

Filed Apr. 5, 1985, Ser. No. 720,255

Int. Cl.[4] G06F *15/46, 15/66;* H04N *7/18, 1/40*

U.S. Cl. 364—475 **46 Claims**



1. A method of registering a pair of color separation films containing halftone dot detail, said method comprising the steps of:

selecting one of the films as a reference film;

selecting first and second spaced apart locations on the reference film;

recording first and second pictures of portions of said reference film which are substantially centered at the respective first and second locations;

recording third and fourth pictures of portions of the other film centered at locations thereon which approximately correspond to but may be offset from the respective first and second locations;

analyzing each of said pictures to obtain a picture analysis therefrom; and

using the picture analyses to assist correlating said pictures to determine the translational movement necessary to obtain registration of the first and third pictures and the second and fourth pictures.

4,641,245

CONVEYOR SYSTEM COMPRISING ELECTRICALLY DRIVEN CONVEYOR CARS THAT ARE CLOSEABLE BY MEANS OF A COVER

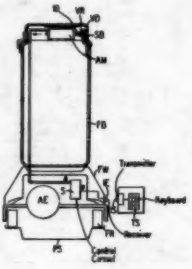
Klaus-Peter Dziggel, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

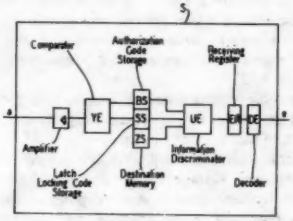
Filed Apr. 17, 1984, Ser. No. 601,155

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3313951

Int. Cl.[4] B65G *35/00, 43/00*

U.S. Cl. 364—478 **14 Claims**





1. A conveyor system, comprising:

electrically driven conveyor cars for movement between dispatch stations and receiving stations each having a container space and a cover for closing said container space,

an electromechanical actuator,

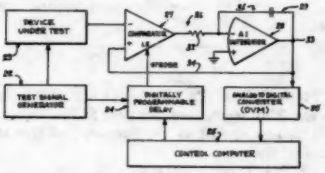
a latch mounted for locking said cover and connected for actuation by said actuator for shifting to a cover locking position, and

control means for controlling release of said latch from the cover locking position, said control means including an authorization evaluation means for control by a latch locking code established in said conveyor car remotely of a receiving station, and said control means blocking release of said latch until a corresponding authorization code is input at a receiving station and evaluated by said authorization evaluation means as corresponding to the latch locking code.

4,641,246
SAMPLING WAVEFORM DIGITIZER FOR DYNAMIC TESTING OF HIGH SPEED DATA CONVERSION COMPONENTS

Joel M. Halbert, and Myron J. Koen, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Oct. 20, 1983, Ser. No. 543,853
Int. Cl.[4] G01R *23/16*; G06F *15/31*
U.S. Cl. 364—487 **60 Claims**



1. A sampling waveform digitizer for the dynamic testing of high-speed data conversion devices comprising:

a source of waveform signal to be tested;

comparator means having at least first, second, and third inputs and at least one comparator output;

means for operably coupling said waveform signal to be tested to said first input of said comparator means;

means for integrating the output signal from said at least one comparator output of said comparator means;

means for feeding back the integrated output signal from the output of said integrating means to said second input of said comparator means to form a comparator-integrator loop means;

a control means for programmably selecting a sample point in the waveform signal being tested;

means responsive to said control means for generating a sequence of programmably narrow strobe pulses;

means for operably coupling said strobe pulses to said third input of said comparator means for repeatedly strobing said comparator means at a selected sample point until said means for feeding back said integrated output signal forces the signal present at the second input of said comparator means to oscillate about the sample value of the input waveform signal being tested at the first input for establishing an equilibrium condition; and

analog-to-digital converter means responsive to an equilibrium condition in said comparator-integrator loop means which results when the integrated output signal oscillates about the sampled value for reading said value and converting same into a digital equivalent value of the amplitude point read for storage, software processing and computer analysis.

4,641,247
BIT-SLICED, DUAL-BUS DESIGN OF INTEGRATED CIRCUITS

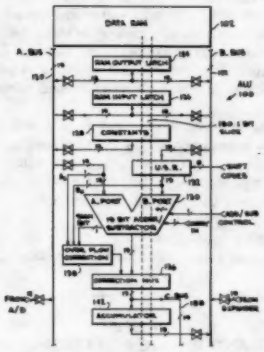
Ronald C. Laugesen, Los Gatos, and Padmanabha I. Venkitakrishnan, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 30, 1985, Ser. No. 771,387
Int. Cl.[4] G06F *15/60*
U.S. Cl. 364—490 **8 Claims**

1. A portion of a monolithic integrated circuit chip performing operations in parallel on a plurality of signals, comprising:

at least two plural-conductor time-division multiplexed bidirectional busses, each having a conductor carrying one of said plurality of signals operated on by said chip portion; and

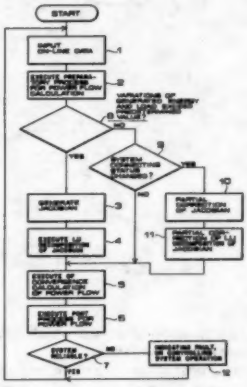
a plurality of circuit elements each performing parallel operations on a predetermined one of said plurality of signals; wherein each said circuit element is assigned a predetermined time-division slot of at least one of said busses and each said circuit element comprises a plurality of subelements each connected to a predetermined one of said conductors of said at least one bus.



4,641,248
METHOD FOR DETERMINING RELIABILITY IN ELECTRIC POWER SYSTEM

Mamoru Suzuki, Tokyo, and Shinta Fukui, Hyogo, both of Japan, assignors to The Tokyo Electric Power Co., Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,351
Claims priority, application Japan, Nov. 17, 1982, 57-201514
Int. Cl.[4] G05B *9/02*
U.S. Cl. 364—492 **4 Claims**


START
INPUT ON-LINE DATA
EXECUTE PREPARATORY CALCULATION FOR POWER FLOW CALCULATION
VARIATIONS OF GENERATED ENERGY AND LOAD AMOUNT OCCUR?
SYSTEM CONNECTING STATUS CHANGED?
VERIFICATION CALCULATION
EXECUTE 1st CALCULATION OF JACOBIAN
EXECUTE 2nd CALCULATION OF POWER FLOW
EXECUTE RELIABILITY CALCULATION
SYSTEM RELIABLE?
OPERATING POINT OF SYSTEM OPERATION

1. A method for determining reliability in an electric power system, comprising the cyclically performed steps of:

inputting various data including data representing generated energy and load amount and connecting status of the power system;

executing a first calculation process with respect to a Jacobian;

executing a second calculation process for converging calculation of power flow;

executing a reliability decision process for determining the reliability of the power system from the result of said first and second calculation processes;

executing a first variation decision process for determining whether any variation shown in the data of the generated

energy and load is less than a predetermined value and carrying out said first calculation process if an affirmative result is obtained;

if a negative result is obtained in said first variation decision process, executing a second variation decision process for determining whether any change in the connecting status for the power system has occurred and carrying out said second calculation process if a negative result regarding the connecting status is obtained in said second decision process;

if an affirmative result is obtained in said second variation decision process, executing a third calculating process for partially correcting of the calculation result of said first calculation process regarding the Jacobian in a preceding cycle and then carrying out said second calculation process; and

executing a process for indicating a fault in the power system in response to a negative result in the reliability decision process.

4,641,249

METHOD AND DEVICE FOR COMPENSATING TEMPERATURE-DEPENDENT CHARACTERISTIC CHANGES IN ION-SENSITIVE FET TRANSDUCER

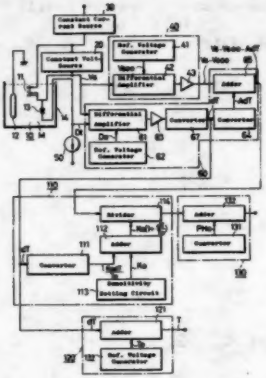
Hidenori Gion; Kenji Kubota, both of Okayama; Michihiro Nakamura, Soja, and Makoto Yano, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Filed Jun. 19, 1984, Ser. No. 622,250

Claims priority, application Japan, Jun. 22, 1983, 58-113298; Apr. 24, 1984, 59-82698

Int. Cl.[4] G01N *27/14, 27/46;* G06F *15/42*

U.S. Cl. 364—496 **9 Claims**



1. An ion activity monitoring device which comprises:

a semi-conductor device including,

an ion-sensitive field-effect transistor for detecting the activity of ions in a liquid medium of interest, and developing an ion activity signal indicative thereof, and

a temperature sensor for detecting the temperature of the liquid medium of interest and developing a temperature signal indicative thereof;

a constant current circuit for supplying to the ion-sensitive field-effect transistor a drain current satisfying the following relationship;

$$|Id/\beta| \leq 0.10 \text{ volt}^2$$

wherein Id represents the drain current and β represents the channel characteristic value of the ion-sensitive field-effect transistor during the operation thereof; and

a processing circuit, responsive to both the ion activity signal from the ion-sensitive field-effect transistor and the temperature signal from the temperature sensor, for calculating the concentration of the ions in the liquid medium of interest, said processing circuit including,

temperature zero-adjustment compensating means for effecting a zero adjustment to the ion activity signal from the ion-sensitive field-effect transistor, and a zero adjustment to the temperature, signal from the temperature sensor, and

temperature sensitivity compensating means for adjusting the sensitivity of the monitoring device to the ion activity, based on both the ion activity signal and the temperature signal.

4,641,250

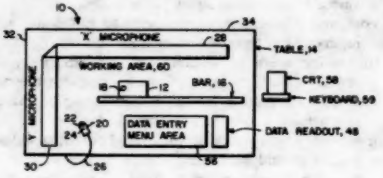
INSPECTION WORKSTATION DATA ENTRY METHOD

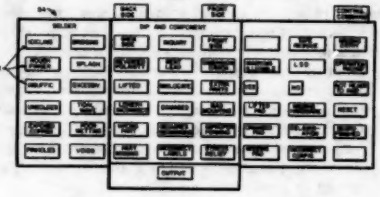
David Strong, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 11, 1984, Ser. No. 619,244

Int. Cl.[4] G06F *15/46, 11/30*

U.S. Cl. 364—507 **3 Claims**





3. An inspection workstation for use in a data entry method, said workstation comprising:

a table, said table having a substantially flat work area, said work area having a straight reference bar thereon, said bar acting as a stop against which an electronic assembly is placed during inspection;

means for receiving a sound in an orthogonal manner, said means for receiving being mounted about said work area, said means for receiving outputting signals upon receipt of an omitted sound, said signals corresponding to an x-y position upon said work area;

means for selectively emitting said sound, said means for emitting being hand transportable about said work area, said means for selectively emitting having aiming means, said aiming means positioning said means for selectively emitting said sound whereby when said emitted sound is received by said means for receiving, said output signals correspond to a position being a target of said aiming means;

a data entry menu, said menu being located near said work area, said menu having a plurality of items, each item being a statement relating to the inspecting of said electronic assembly being inspected, an inspector selecting said statement by use of said means for selectively emitting sound;

a display means, said display means being located near said table, said display means outputting information about said electronic assembly being inspected;

a data input means for inputting information; and

a processing means, said processing means connected to said means for receiving, said display means, and said data input means, said processing means having stored therein the location of said reference bar, information about said electronic assembly, and a program to process defect information of said electronic assembly.

4,641,251

ROBOT

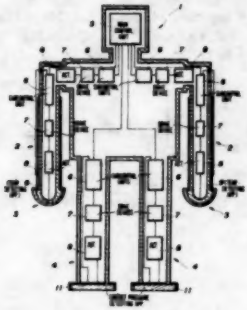
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,521

Claims priority, application Japan, Feb. 16, 1982, 57-22117; Feb. 18, 1982, 57-23565

Int. Cl.⁴ G05B *19/42*

U.S. Cl. 364—513 **29 Claims**



1. A robot comprising: a plurality of operating portions, said robot having overall movements and individual movements of the respective operating portions, a main control means for controlling overall movements of the robot; at least one detecting means in each operating portion of the robot for detecting the exterior environment around each of said operating portions; and at least one subcontrol means for individually controlling the operations of each of said operating portions in accordance with output from said main control means and output from the respective said detecting means, means associated with at least one of said main control means and said subcontrol means for providing a learning function for the associated means by which when said operating portions of the robot are initially moved by an external force, the course of movement is memorized and thereafter the same motion can be repeatedly carried out, said means for providing a learning function when the operating portions of the robot are initially moved by an external force comprising means for producing a plot of the course of travel of a specific point on said operating portion during movement of said operating portion; means for dividing said course into a number of intervals; means for replacing the course of travel in each interval by an approximation of a straight line or a circular arc to produce an approximation course of travel consisting of straight lines and circular arcs; and means for memorizing the travel of said specific point along said approximation course of travel, said means for dividing said course of travel of the specific point into a number of intervals and said means for replacing the course of travel of each interval by the straight line or circular arc comprising:

(a) means for calculating and temporarily recording locations (designated as passing points) of said specific point corresponding to each state of the robot in the course of its motion, each of said states being sequentially and time-divisionally recorded to define the motion of the robot;

(b) means for effecting a straight line checking step in which the longest approximation line segment is determined, said segments connecting the starting point of the course of travel (Xo, Yo, Zo) and the "i"th passing point (Xi, Yi, Zi), (wherein "i" is larger than a predetermined minimum limit value i-min), said passing points being successively located on the course of travel from the starting point (Xo, Yo, Zo) to the end point (Xz, Yz, Zz), wherein all of deviation distances Lij do not exceed a permissive error E and the value of i is maximum, said distances Lij being defined by the distances between said longest segment and each passing point (Xj, Yj, Zj) which is located between said two points, (wherein j=1, 2, . . . , (i−1));

(c) means for effecting a straight line interval setting step when the solution i=n is obtained in means (b), wherein the segment which connects the starting point (Xo, Yo, Zo) and the point (Xn, Yn, Zn) is set as the interval for the straight line, the data of said segment being recorded;

(d) means for effecting a circular arc checking step when no solution is obtained in means (b), wherein an optimum circular arc is obtained, in which all of the deviation distances Dkl do not exceed the permissive error E and the value of j is maximum, said optimum circular arc being selected from circular arcs which are defined by three points consisting of the starting point (Xo, Yo, Zo), the "k"th passing point (Xk, Yk, Zk) from said starting point (Xo, Yo, Zo), (wherein k is larger than a predetermined minimum limit value k-min), and an arbitrary passing point (Xs, Ys, Zs) which is located between said two points, said distances Dk1 being defined by the distances between said circular arc and other passing points (Xl, Yl, Zl) which are located between said two points; means for effecting a circular arc interval setting when the solution j=m is obtained in means (d), wherein the circular arc which connects said starting point (Xo, Yo, Zo), and said passing points (Xs, Ys, Zs) and (Xm, Ym, Zm) is set as the interval for the circular arc, and the data of said circular arc are recorded; and

(e) means for repeating the calculations to set the course of travel continuously over the entire interval, in which the end point (Xn, Yn, Zn) or (Xm, Ym, Zm) of the interval which is obtained by means (c) or (e) is set as the successive starting point, and the same calculations by means (b)–(e) are executed, and repeated successively for the passing points from said starting point to the final end point (Xz, Yz, Zz), to produce the continuous approximation course of travel.

4,641,252

ELECTRON BEAM DRAWING CONTROL SYSTEM

Masakazu Tokita, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1982, Ser. No. 405,982

Claims priority, application Japan, Oct. 1, 1981, 56-156641; Oct. 22, 1981, 56-169328

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—518 **16 Claims**

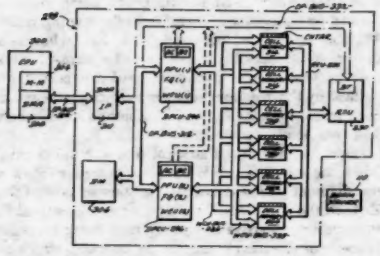
1. An electron beam drawing control system comprising:

first memory means for storing parametric data describing at least one of the size, location and shape of figures to be drawn;

a plurality of dot pattern converting means for collectively reading out said parametric data sequentially from said first memory means and for generating dot pattern data corresponding to said figures, said plurality of converting means all operating simultaneously to simultaneously convert a plurality of said parametric data to dot pattern data so that said parametric data representing figures to be drawn is converted more quickly than if a single dot pattern converting means is employed;

a plurality of second memroy means for storing dot pattern

data generated by said plurality of dot pattern converting means in the same order as parametric data is read from said first memory means and converted by said plurality of converting means, a plurality of said second memory means being provided to enable said plurality of converting means to store dot pattern data without delay; and



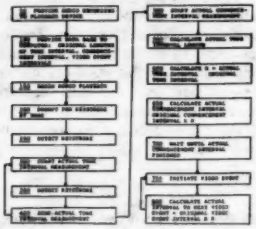
read control means for reading out said dot pattern data from said plurality of second memory means in the same order as said dot pattern data was stored in said second memory means, said plurality of converting means and said plurality of second memory means allowing the rate of data read out by said read control means to be greater than if a single converting means and single second memory means are employed.

4,641,253

PROCESS FOR SYNCHRONIZING COMPUTER VIDEO WITH INDEPENDENT AUDIO

David V. Mastran, Great Falls, Va., assignor to Maximus, Inc., McLean, Va.

Filed Jun. 6, 1984, Ser. No. 617,915
Int. Cl.[4] G06F *3/153, 15/44;* G11B *31/00*
U.S. Cl. 364—518 **16 Claims**



1. A method for synchronous presentation of independent audio program and video program generated by a digital computer, comprising:

a. providing an audio recording to an independent audio playback device, said audio recording comprising at least two consecutive cue tones at known original intervals, followed by an audio program commencing at a known original commencement interval after a last one of said consecutive cue tones;

b. providing a database to said computer comprising at least said known original cue tone intervals, said known original commencement interval, and a plurality of original video graphics event intervals for a video program comprising a plurality of videographics events to be synchronized with said audio program;

c. starting said audio playback device to play said recording;

d. initiating an interval timer in said computer when one of said cue tones is played;

e. stopping said interval timer in said computer when a next subsequent one of said cue tones is played, and determining an actual time interval between said cue tones as played on said audio playback device;

f. repeating steps d and e for each of said known original intervals between said cue tones;

g. calculating in the computer a ratio R equal to the actual cue tone interval divided by the corresponding original cue tone interval;

h. initiating said interval timer and waiting an actual commencement interval equal to the original commencement interval multiplied by R; and

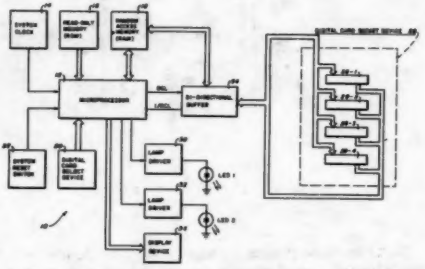
i. repeatedly initiating said interval timer, and display video graphics events, at actual video graphics event intervals corresponding to said original video graphics event intervals multiplied by R.

4,641,254

TEST SET FOR A NAVIGATIONAL SATELLITE RECEIVER

Donald L. Mitchell, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 14, 1984, Ser. No. 620,658
Int. Cl.[4] G01R *31/28;* G06F *11/22*
U.S. Cl. 364—580 **9 Claims**



1. A digital card tester section of a test set for detecting the reduced capabilities of an associated navigational satellite receiver, said digital card tester section being configured to generate signals (signatures) for testing and isolating faults in a predetermined number of digital system cards of the associated navigational satellite receiver according to a predetermined program, said digital tester card section comprising:

a read-only memory (ROM) being configured to store the predetermined program which corresponds to at least the signatures of the predetermined numbers of digital system cards under test;

a random access memory (RAM) being configured to permit data, in the form of the signatures, and in the form of responses, from the predetermined number of digital cards under test to be stored or retrieved at comparable intervals according to predetermined periodic signals;

a system clock for generating the predetermined periodic signals for proper synchronization of signatures, responsive signals, and timing signals;

a microprocessor operatively connected to said ROM, to said RAM and to said system clock for decoding and executing the predetermined program stored in said ROM;

connection means for operatively connecting the predetermined number of digital system cards under test to said microprocessor and said RAM;

intialization means operatively connected to said microprocessor for instituting initialization thereof, and of said ROM and said RAM; and

display means operatively connected to said microprocessor for displaying the output of the RAM for the predeter-

mined number of digital system cards, and for indicating the faults therein

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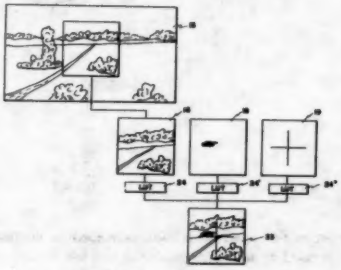
4,641,255
APPARATUS FOR SIMULATION OF VISUAL FIELDS OF VIEW

Thomas Hohmann, Hanau, Fed. Rep. of Germany, assignor to Honeywell GmbH, Offenbach, Fed. Rep. of Germany

Continuation of Ser. No. 736,980, May 22, 1985, abandoned, which is a continuation of Ser. No. 443,005, Nov. 19, 1982, abandoned. This application Jan. 21, 1986, Ser. No. 821,509

Int. Cl.⁴ G06F *16/626*; G09G *1/14*

U.S. Cl. 364—522 **7 Claims**



1. In apparatus for simulating a visual field of view for training in a battle situation including means for displaying the image of a background on a TV-monitor in the field of view of an optical system used by a person to be trained, said image of said background being digitally stored, and including changeable addressing means whereby different partial cut-outs from said background image may be selectively displayed on said TV-monitor, the improvement comprising:

a buffer storage memory;

means for loading a first partial cut-out from said background image into said buffer memory, said means for loading including means for loading a subsequent partial cut-out from said background having a changed address in such manner that so much of said subsequent partial cut-out as overlaps said initial partial cut-out remains in said buffer memory with only so much of said subsequent partial cut-out as differs from said initial cut-out being loaded into the buffer memory, replacing so much of said first partial cut-out as differs from said subsequent partial cut-out, said loading means including first addressing means for selectively controlling said loading of said buffer memory; and

readout means for selectively coupling said buffer memory to said TV-monitor, said readout means including modulo (m−1) row address counter (37) and a modulo (n−1) column address counter wherein m and n are numbers representing powers of two.

4,641,256
SYSTEM AND METHOD FOR MEASURING ENERGY TRANSMISSION THROUGH A MOVING APERTURE PATTERN

Joseph E. Marchegiano, Wilmington, Del., and Anthony S. Baran, Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 4, 1984, Ser. No. 678,211

Int. Cl.⁴ G01N *21/00, 21/84*

U.S. Cl. 364—525 **21 Claims**

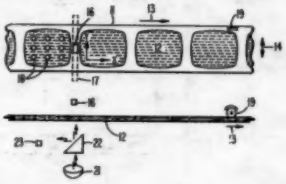
1. A system for measuring energy transmission through an aperture pattern in a longitudinally moving opaque strip of material, comprising:

means for scanning energy transversely across said strip;

a CCD (charge coupled device) sensor having at least one row of pixels arranged substantially perpendicular to said strip, and having at least one pixel centered over said strip when said strip is located at an optimum location; said CCD being positioned to receive said energy through said apertures;

means for defining inspection areas within said aperture pattern where energy transmission through said aperture pattern is measured;

said inspection areas being defined by preselected pixels of said CCD when said CCD is scanned by energy passing through said inspection areas;



encoder means responsive to said longitudinal motion for providing count pulses;

counter means responsive to said count pulses, said inspection areas being scanned by said energy on preselected counts, whereby the energy levels on said preselected CCD pixels is indicative of energy transmission through said aperture patterns; and

adder means responsive to said preselected pixel levels for adding said pixel levels for each of said inspection areas, and providing the energy transmission through each of said inspection areas.

4,641,257
MEASUREMENT METHOD AND APPARATUS FOR ALIGNMENT

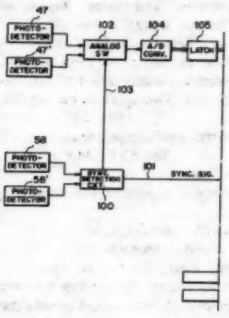
Naoki Ayata, Machida, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Jul. 2, 1984, Ser. No. 626,990

Claims priority, application Japan, Jul. 7, 1983, 58-122342; Jul. 7, 1983, 58-122345

Int. Cl.⁴ G01B *11/00*; H04N *7/18*

U.S. Cl. 364—559 **3 Claims**

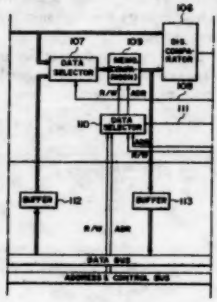


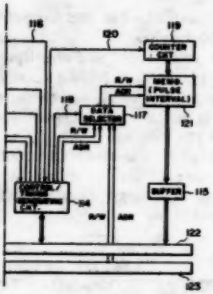
1. A measurement apparatus, comprising:

detecting means for detecting a mark on each of a plurality of objects and for producing a signal having a peak value in response to the detection of each of the marks, so as to form a series of signals;

peak detecting means for detecting the peak values of the signals;

means for determining a slice level for each of the peak values detected by said peak detecting means; and





means for sequentially comparing the signals with their respective slive levels, as determined by said slice level determining means, and for determining an interval between the marks on the basis of the comparison.

4,641,258

ELECTRONIC COMPUTER WITH AURAL OUTPUT

Tsuyoshi Kawanabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 639,622, Aug. 9, 1984, abandoned, which is a continuation of Ser. No. 442,902, Nov. 19, 1982, abandoned, which is a continuation of Ser. No. 197,592, Oct. 16, 1980, abandoned. This application Sep. 30, 1985, Ser. No. 781,321

Claims priority, application Japan, Oct. 17, 1979, 54-132827

Int. Cl.[4] G06F 3/16

U.S. Cl. 364—710 **7 Claims**

1. An electronic apparatus for producing a voice output comprising:

a first manually operable key;

a second manually operable key;

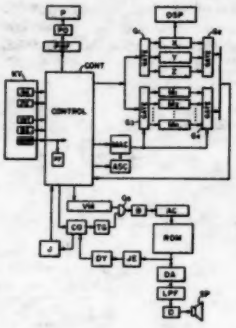
data memory means for storing data;

voice memory means for storing voice information corresponding to said data stored in said data memory means for providing a voice output from said apparatus;

address menas for addressing said data memory means to read out data stored therein;

first control means connected to and responsive to actuation of said first manually operable key for controlling said address means to address said data memory means in a first order to read out said data therefrom and for controlling the reading out of said voice information from said voice memory means in accordance with said data read out from said data memory means; and

second control means connected to and responsive to actuation of said second manually operable key upon stopping of the operation of said address means by said first control means for controlling said address means to step back the address of said data memory means addressed in the first



order to a stepped-back address preceding the last address addressed by said address means and for thereby repeating the reading out of said voice information automatically from said voice memory means in accordance with the data read out from said data memory means beginning with said stepped-back address which becomes a start address for reading out data in the first order from said data memory means.

4,641,259

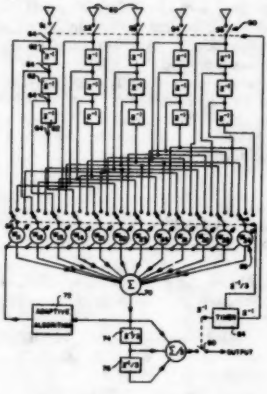
ADAPTIVE SIGNAL PROCESSING ARRAY WITH SUPPRESSION OF COHERENT AND NON-COHERENT INTERFERRING SIGNALS

Tiejun J. Shan, and Thomas Kailath, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Jan. 23, 1984, Ser. No. 572,997

Int. Cl.[4] G06F 15/31

U.S. Cl. 364—724 **6 Claims**



1. An adaptive signal processing array comprising

a plurality of signal detectors,

a plurality of variable weighting means each connected to

one of said signal detectors for weighting signals from said detectors,

means for grouping said weighting means into sub-groups of less than all of said plurality of weighting means for weighting sub-groups of signals,

first summing means connected with said subgroups of weighting means for summing said weighted signals of each sub-group and producing a first summed signal,

means including an adaptive algorithm processor for operating on said first summed signal and producing a feedback signal, and

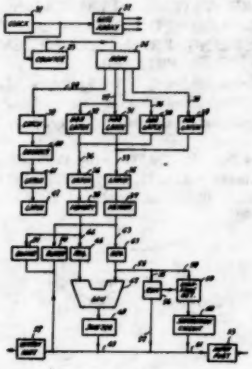
means connecting said feedback signal to said plurality of variable weighting means for adjusting the variable weights thereof.

4,641,260

DIGITAL SIGNAL PROCESSING APPARATUS FOR A BLOOD FLOWMETER USING ULTRASOUND DOPPLER EFFECT

Hiroshi Fukukita, Tokyo; Ryobun Tachita, Kawasaki; Kuniaki Fukaya, Atsugi, and Tsutomu Yano, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 5, 1983, Ser. No. 558,274
Claims priority, application Japan, Dec. 3, 1982, 57-212934
Int. Cl.[4] G06F 11/00, 15/35, 15/42, 7/34
U.S. Cl. 364—737 6 Claims



1. A digital signal processing apparatus comprising

a digital processing means,

n-bit input and output data bus lines for said digital processing means,

a memory means for transferring and receiving data to and from said digital processing means,

a fixed instruction generating means for generating operating code for said digital processing means and addresses for said memory means,

a read only memory for performing a squaring operation and having a l-bit address input and a k-bit output, the address input of which is bit position m to m+l−1 of the n-bit input data bus line of said digital processing means, and the output data of which is bit position n−k to n−1 of the n-bit output data bus line of said digital processing means,

an overflow detecting means having an input of bit positions m+l−1 to n−1 of sand n-bit input data bus line, and

a j-bit output digital saturation circuit means connected to bit positions n−j to n−1 of said n-bit output data bus line, where j, k, l, m and n are integers having a relationship expressed by:

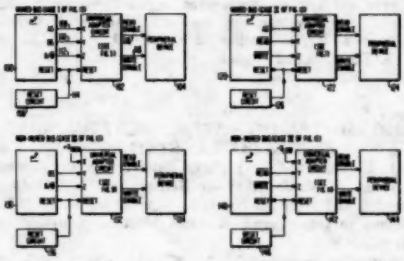
$$j, k, l, m < n.$$

4,641,261

UNIVERSAL INTERFACE CIRCUIT FOR MICROPROCESSOR PERIPHERALS

Robert A. Dwyer, Readington Township, Hunterdon County, and Russell G. Ott, Cranford Township, Union County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 21, 1984, Ser. No. 612,427
Int. Cl.[4] G06F 13/42
U.S. Cl. 364—900 8 Claims



1. A universal interface adapter circuit (UIAC) for connecting between any of four microprocessor types and a peripheral device of the type which functions in response to either a READ ENABLE signal or a WRITE ENABLE signal, the first and second of said four microprocessor types being employed in a multiplexed bus system and having an address strobe output terminal producing an address strobe signal which, when operative, alternates between a high level value and a low level value, said first and third microprocessor types having a read/write output terminal which, when operative, produces a signal the value of which determines whether a read of data or a write of data is occurring and has a data strobe output terminal which, when operative, produces a signal in the form of pulses to indicate when the read or write of data is occurring, said second and fourth microprocessor types having a read output terminal, which, when operative, produces a read output signal to indicate the timing of the read of data and having a write output terminal which, when operative, produces a write signal to indicate the timing of the write of data, the two signals being mutually exclusive, said universl interface adapter circuit comprising, in combination,

a first input terminal connected to said address strobe signal terminal if either of said first and second microprocessor types is connected to said UIAC or connected to a constant level signal, the value of which is dependent on whether said third type or fourth type microprocessor is connected to said UIAC;

second and third input terminals connected respectively to said data strobe signal terminal and read/write signal terminal if either of said first and third microprocessor types is connected to said UIAC or connected respectively to said read and write signal terminals if either of said second and fourth microprocessor types is connected to said UIAC;

first means coupled to said first input terminal for generating a signal the value of which is determinative of whether or not said signal applied to said UIAC first terminal alternates in value and, therefore, for determining whether either of said first and second type microprocessor types is connected to said UIAC or whether either of said third and fourth microprocessor types is so connected;

second means responsive to the signal from said first means when it is of a value indicating that said microprocessor of either of said third and fourth type is connected to said UIAC and responsive to the value of signal at said first input terminal for producing a signal determinative of whether a third microprocessor type is connected to

UIAC or whether a fourth microprocessor type is connected to said UIAC;

third means responsive to the signal from said first means, when it is of a value indicating said first or second microprocessor type is connected to said UIAC, and responsive to value of signal on said second output terminal for producing a signal determinative of whether said first microprocessor type is connected to said UIAC or said second microprocessor type is connected to said UIAC; and

fourth means responsive to said signals indicative of which one of said four microprocessor types is connected to said UIAC and to a signal applied to said second and third terminals for producing said READ ENABLE or WRITE ENABLE signal.

4,641,262

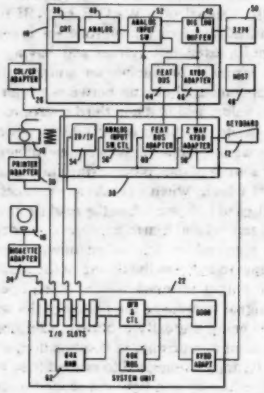
PERSONAL COMPUTER ATTACHMENT FOR HOST SYSTEM DISPLAY STATION

Barry L. Bryan, Woodstock; Martin Druckerman, Poughkeepsie; Allen W. McDowell, Lake Katrine; Ira H. Schneider, Kingston, and Gary L. Newkirk, New Paltz, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 473,058, Mar. 7, 1983, abandoned. This application Mar. 2, 1984, Ser. No. 585,813

Int. Cl.[4] G06Z *15/00, 3/00*

U.S. Cl. 364—900 **16 Claims**



1. A personal computer attachment for a display station of the type that communicates with a host computer for the purpose of accessing data and running programs on said host computer, said display station having a display unit and a keyboard, said display unit including display means for displaying an image, buffer means for supplying image data to said display means, keyboard adapter means for receiving keyboard signals from said keyboard, feature bus means for connecting optional features to said display station, and means for providing an interface to a controller external to said display station and for providing a communication link between said buffer means, said keyboard adapter means and said feature bus means, said personal computer attachment comprising:

a personal computer system unit including a system bus, a microprocessor, memory means and keyboard adapter connected to said system bus, and input/output means connected to said system bus for providing an interface to external devices, said input/output means including a display adapter having a buffer for supplying image data to a display means,

switch means disposed between said display means and said buffer means in said display station and also connected to said display adapter for selectively supplying image data from said buffer means or said display adapter to said display means, and

an attachment adapter including an input/output interface, a switch control, a two-way keyboard adapter, and a feature bus adapter, said keyboard being connected to said two-way keyboard adapter, and each of said switch control, two-way keyboard adapter and feature bus adapter communicating with said system bus of said personal computer system unit via said input/output interface, said switch control further being connected to a control input of said switch means, said two-way keyboard adapter further being connected to said keyboard adapter means in said display station and to said keyboard adapter in said personal computer system unit, and said feature bus adapter further being connected to said feature bus means in said display station whereby keystroke signals from said keyboard are transmitted by said two-way keyboard adapter via said input/output interface and system bus to said memory means of said personal computer for interpretation by said microprocessor and then retransmitted back to said two-way keyboard adapter and either to said keyboard adapter means in said display station or to said keyboard adapter in said personal computer system unit and said switch control being responsive to a unique keystroke signal generated by said keyboard to control said switch means.

4,641,263

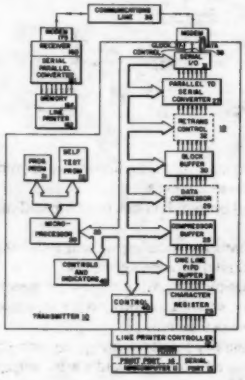
CONTROLLER SYSTEM FOR EMULATING LOCAL PARALLEL MINICOMPUTER/PRINTER INTERFACE AND TRANSFERRING SERIAL DATA TO REMOTE LINE PRINTER

Eugene H. Perlman, Bedford, N.Y., Laurence MacNaughton, III, Hampton, Conn., and Thomas Loucas, Riverside, Conn., assignors to Digital Associates Corporation, Bridgeport, Conn.

Continuation of Ser. No. 378,793, May 17, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 618,994

Int. Cl.[4] G06F *3/12, 3/023, 11/10, 15/16*

U.S. Cl. 364—900 **8 Claims**



1. A remote line printer system for printing data at a remote location comprising:

(a) a conventional minicomputer having a print port dedicated to driving a local line-by-line printer and at which the bits of each data character and each control character appear in parallel, said conventional minicomputer also having a communications port dedicated to transmitting data to a remote location and at which the bits of a data character to be transmitted appear in series;

(b) line printer controller means coupled to said print port for receiving data character and control character bits in

parallel, said line printer controller means emulating the interface between said conventional minicomputer and a local line-by-line printer;

(c) character register means coupled to the output of said line printer controller means for storing characters of data;

(d) block buffer storage means coupled to the output of said character register means for storing a plurality of characters comprising one or more lines of characters to be printed;

(e) first microprocessor means;

(f) parallel-to-serial conversion means comprising a circuit controlled by said first microprocessor means coupled to the output of said block buffer storage means and responsive to the parallel bits of data characters for converting the data characters from parallel to serial representation;

(g) communications means coupled to said parallel-to-serial conversion means and controlled by said first microprocessor means for transmitting character data serially to said remote location;

(h) data compression means controlled by said first microprocessor means for suppressing trailing blanks and encoding iterations of the same character such that a string of up to 64 characters can be transmitted as a 3-character sequence;

(i) said first microprocessor means also controlling the encoding and transmission of control status and control signals via said communications means;

(j) said first microprocessor means also controlling errors by error detection and retransmission to correct errors in character data transmitted by said parallel-to-serial conversion means to said remote location;

(k) serial-to-parallel conversion means at the remote location coupled to said communications means for converting serial character data to parallel character data; and

(l) line printer means at the remote location coupled to said serial-to-parallel conversion means for storing the parallel character data and then printing stored characters line by line, said line printer means including error checking means for generating and transmitting, via said communications means, to said parallel-to-serial conversion means a retransmission signal if any character is erroneously received.

4,641,264

METHOD FOR AUTOMATIC TRANSLATION BETWEEN NATURAL LANGUAGES

Yoshihiko Nitta, Fujisawa; Atsushi Okajima, Yokohama, and Fumiyuki Yamano, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,601

Claims priority, application Japan, Sep. 4, 1981, 56-138586

Int. Cl.⁴ G06F *15/38*

U.S. Cl. 364—900 **18 Claims**

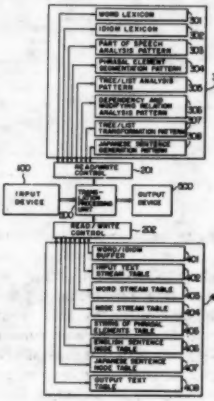
1. An automatic translation method between natural languages using a translation processing apparatus to which an input text sentence composed of a natural language is inputted in the form of an electrical signal from an input device and which carries out predetermined translation processes by referring to an electronic data storage device having a word/idiom lexicon storage area in which target language equivalent information and part of speech information on words/idioms are stored and a plurality of table storage areas in which tables defining predetermined translation rules are stored, said method comprising:

(a) a first step of assigning parts of speech to a string of words/idioms of the input text sentence inputted from said input device by referring to said word/idiom lexicon storage area of said electronic data storage device so as to provide a corresponding string of parts of speech;

(b) a second step of dividing the input text sentence transformed in the form of said string of parts of speech into phrasal elements which are minimum units having linguistic meanings and assigning phrasal parts of speech to the respective phrasal elements by referring to a first table storage area of said electronic data storage device in which a table indicating a relation between patterns of strings of predetermined parts of speech which form the phrasal elements and phrasal parts of speech of the phrasal elements is stored;

(c) a third step of comparing the sequence of phrasal parts of speech assigned to the phrasal elements and the words/idioms with predetermined strings of parts of speech to assign syntatic roles to the respective phrasal elements and words/idioms, said predetermined strings of parts of speech being stored in a second table storage area of said electronic data storage device together with the syntatic roles associated therewith;

(d) a fourth step of detecting patterns representing a simple sentence, a clause and a quasi-clause from the string of syntatic roles to transform the input text sentence to a skeleton pattern represented by a combination of said patterns;



(e) a fifth step of transforming the sequence of simple sentence, clause and quasi-clause inherent to the input language which forms the skeleton pattern to a sequence of simple sentence, clause and quasi-clause inherent to an output language by applying a predetermined transformation rule which is stored in a third table storage area of said electronic data storage device;

(f) a sixth step of transforming the sequence of syntatic roles inherent to the input language within each of the simple sentence, clause and quasi-clause which forms said transformed skeleton pattern to a sequence of syntatic roles inherent to the output language by applying a predetermined transformation rule; and

(g) a seventh step of assigning target language equivalents to the respective ones of the transformed string of syntatic roles to generate a sentence in the output language in the form of an electrical output signal.

4,641,265

SYSTEM FOR CONTROLLING THE PROPORTION OF LEAF VEIN IN TOBACCO RAW MATERIAL TREATING PROCESS

Kenichi Kagawa, Hiratsuka, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,274

Claims priority, application Japan, Jul. 27, 1983, 58-135784

Int. Cl.⁴ G05B *13/02*; A24B *5/10*; G06F *15/46*

U.S. Cl. 364—153 **6 Claims**

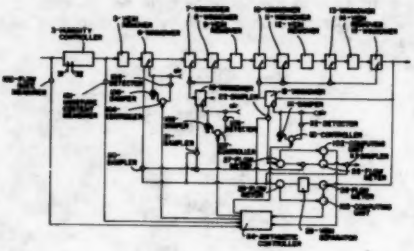
1. A system for controlling the proportion of leaf vein in leaf

lamina produced in a tobacco leaf treating system having a humidity controller for adjusting the temperature and moisture content of raw leaf tobacco to levels necessary for the removal of leaf vein, means for feeding the raw leaf tobacco into said humidity controller, means for removing leaf vein from leaf lamina, and winnowing means for separating the removed leaf vein and the leaf lamina, said winnowing means having means for blowing air at predetermined velocities in said winnowing means, said control system comprising:

means for measuring the flow rate of the raw leaf tobacco into said treating system;

means for measuring the moisture content of the raw leaf tobacco from said humidity controller;

means for selectively sampling the lamina output of said winnowing means;



means for measuring the proportion of leaf vein in the lamina samples;

arithmetic controlling means for inputting the flow rate determined by said flow rate measuring means and the moisture content determined by said moisture content measuring means and calculating an optimum air velocity for said winnowing means so that the leaf vein proportion is within a certain range of a predetermined value, said arithmetic controlling means including feedback means for simultaneously inputting the leaf vein proportion determined by said leaf vein proportion measuring means and, based thereon, adjusting the calculated optimum air velocity; and,

means for regulating the air velocity in said winnowing means based on the calculated optimum air velocity.

4,641,266

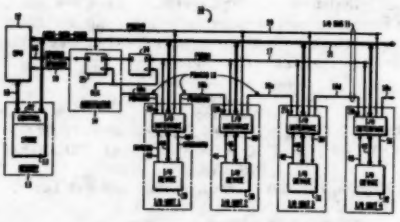
ACCESS-ARBITRATION SCHEME

Patrick M. Walsh, Chicago, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 28, 1983, Ser. No. 555,695

Int. Cl.⁴ G06F *13/24*

U.S. Cl. 364—200 **23 Claims**



1. A processing system comprising:

a plurality of resource users;

a resource shared by the plurality of users;

an arbitrator for controlling access by the plurality of users to the resource;

first means coupling the plurality of users to the arbitrator for conveying requests for resource access from the plurality of users to the arbitrator;

second means coupling the arbitrator and the plurality of users in a chain for conveying grants of resource access from the arbitrator to the users;

means associated with each user and coupled to the first conveying means for preventing the associated user from issuing a request for resource access on the first conveying means, while another user has a request for resource access pending with the arbitrator; and

means associated with each user and cooperative with the second conveying means for causing the associated user to continue issuing its issued request for resource access on the first conveying means until termination of receipt at the associated user of a grant of resource access on the second conveying means.

4,641,267

GRADATION CORRECTION CURVE CREATING METHOD AND APPARATUS

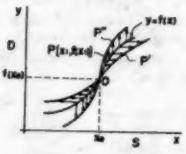
Eiichi Asai; Hiroshi Tanaka, and Nobuaki Higashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 1, 1983, Ser. No. 547,620

Claims priority, application Japan, Nov. 4, 1982, 57-193770

Int. Cl.⁴ G06F *15/42*; G06G *7/60*; H04N *1/40*; H01Q *21/00*

U.S. Cl. 364—414 **5 Claims**



1. A method of creating a curve for correcting the gradation of a radiation image which is first recorded in a stimulable phosphor as a pattern of radiation energy having a radiation energy level wherein said stimulable phosphor is then scanned with stimulating rays to cause the stimulable phosphor to emit light of an amount proportional to the level of the stored radiation energy, the emitted light is then detected and converted to an electric signal having an electric signal level corresponding to the emitted amount of the light, and a visible image corresponding to said radiation image can then be reproduced on a recording material by use of the electric signal,

the method of creating a curve for correcting gradation of the radiation image comprising the steps of:

(i) creating several reference curves on an orthogonal system of signal level-optical density coordinates wherein the optical density of the visible image reproduced on said recording material is plotted on one coordinate axis and the level of said electric signal is plotted on the other coordinate axis,

(ii) selecting one of said reference curves, and

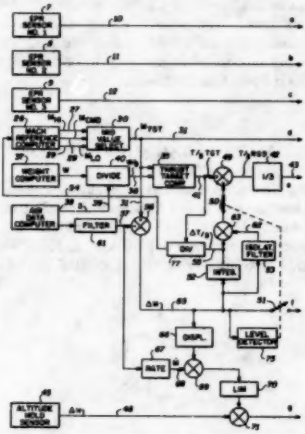
(iii) rotating the selected reference curve around a point on said reference curve on said coordinate system, and/or parallel-shifting said reference curve on said coordinate system, thereby obtaining a desired gradation correction curve.

4,641,268

CRUISE AIRSPEED CONTROL FOR AIRCRAFT

Terry L. Zweifel, Phoenix, and Harry Miller, Scottsdale, both of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,357
Int. Cl.[4] G05D 1/08; G06F 15/50
U.S. Cl. 364—440 11 Claims



1. A speed control system for aircraft having an automatic throttle control means for controlling the thrust imparted to the aircraft and having first dynamic response characteristics and an automatic altitude control means for controlling pitch attitude to maintain a predetermined altitude and having second dynamic response characteristics comprising:

means providing a speed error signal proportional to the difference between a reference speed and the actual speed,

means providing an altitude error signal proportional to the difference between a reference altitude and the actual altitude,

first integrator means responsive to said speed error signal for controlling said throttle control means,

second integrator means responsive to said altitude error signal and said speed error signal for controlling said altitude control means, and

isolation filter means responsive to said speed error signal for additionally controlling said throttle control means, said filter having a frequency response to said speed error signal such as to minimize interference between said first and second dynamic response characteristics by accepting long term changes in airspeed and rejecting short term changes in airspeed due to changes in pitch attitude.

4,641,269

PROGRAMMABLE CONTROL SYSTEM FOR GLASSWARE FORMING MACHINES

Robert J. Japenga, Simsbury, and Paul F. Scott, Granby, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 765,566, Aug. 13, 1985, abandoned, which is a continuation of Ser. No. 461,086, Jan. 26, 1983, abandoned. This application Jul. 9, 1986, Ser. No. 883,460
Int. Cl.[4] G06F 15/46; C03B 9/40
U.S. Cl. 364—473 17 Claims

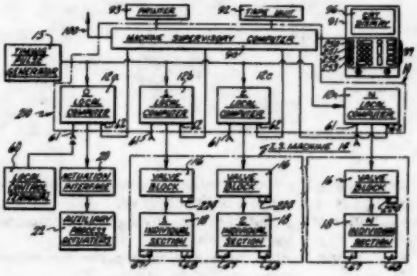
1. In a glassware forming machine of the "individual section" type including a plurality of sections operable in phased relationship within a cycle of operation of the machine, each of said sections having a complete set of functional components for receiving gobs of molten glass and forming glassware articles in response to control signals which actuate and deactuate said functional components, said glassware forming machine providing a machine synchronizing signal at a predetermined point of each cycle of operation,

a control system for enabling the simultaneous and independent operation of said plurality of sections, comprising:

a plurality of local computer means, each respectively associated with one of said sections, for producing the component actuating and deactuating signals in coordination with the machine synchronizing signal, and for identifying said component actuating and deactuating signals with said functional components, each of said local computer means comprising:

unalterable program storage means for storing a section control program to control the operation of said local computer means without regular ongoing communication with any supervisory controller;

non-volatile memory means for storing selected timing data indicative of actuation an deactuation times of said functional components within each cycle of operation, and for storing machine data which together with said timing data specify the parameters of said control program; and



controller means for receiving said machine synchronizing signal and said timing data and machine data and for processing these in accordance with said control program to produce said component actuating and deactuating signals;

a plurality of interface means, each interposed respectively between one of said local computer means and its associated section for actuating and deactuating the functional components of said section in response to said component actuating and deactuating signals;

local terminal means for user display, entry, and modification of selected timing and machine data, wherein said local terminal means is capable of handling all parameters of said section control program; and

bidirectional communication means for connecting said local terminal means to a selected one of said local computer means.

4,641,270

PROCESS FOR MANUFACTURING A MOLD USING THREE-DIMENSIONAL COMPUTER MODELLING

Paul Lalloz, Montigny les Cormeilles, and Hung A. Vo, Orly, both of France, assignors to La Telemecanique Electrique, France

Filed Apr. 24, 1985, Ser. No. 726,578
Claims priority, application France, Apr. 25, 1984, 84 06471
Int. Cl.[4] G06F 15/46; G05B 19/00; B22D 17/22
U.S. Cl. 364—476 4 Claims

1. A process for manufacturing a mold from the shapes of a piece which it is desired to obtain by molding, by computer modelling of the fixed and mobile parts of a mold using a computer assisted design software for visualizing the piece in two and three dimensions, comprising at least the following steps:

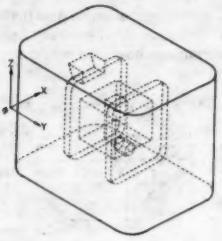
modelling and graphic representation of the piece in three dimensions,

determination, from the shapes of the piece and/or of its model, of a zero joint plane which forms the main separation plane of the two parts of the mold,

modelling and possible graphic representation of the negative of the piece, in three dimensions, within a cubic volume which may have the dimensions of the block of material from which the mold is formed,

insertion of the model of the piece in the model of its negative,

search for the unstrippable zones by simulating a relative movement between the model of the piece and the two parts of the model of its negative defined by the reference plane, along an axis perpendicular to said plane, and by



determining the contact surfaces between the piece and said parts of the model of the negative,

visualization of the contact surfaces by a graphic representation in at least one given plane,

the systematic graphic representation, in planes perpendicular to the reference plane, of the sections of the model of the negative passing through the unstrippable zones and determination of the offset joint planes in successive slices of the model of the negative including said zones and of width equal to those of said zones,

modelling of the mobile and fixed parts of the mold as a function of the established joint planes,

manufacture of a mold whose fixed and mobile parts comprise joint planes and impressions according to the previously established models.

4,641,271

PILING PLANNING METHOD AND PILING SYSTEM OF CARGOES BY PALLETIZING ROBOT

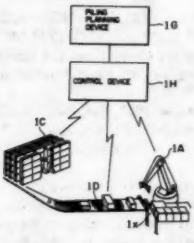
Yozo Konishi, Yokohama; Kichizo Akashi, Ebina; Hideo Watase, Tsuchiura, and Tatsuo Yoshioka, Ichikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 668,962

Claims priority, application Japan, Nov. 9, 1983, 58-209057; Jul. 19, 1984, 59-150058

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—478 **4 Claims**



2. A piling system for cargoes using a palletizing robot comprising, piling planning means for preparing a piling disposition of cargoes on a pallet, a piling order and a sequence of piling operations in response to data as to various sizes of the plurality of cargoes to be transported, control means receiving data from said piling planning means for controlling a piling operation in accordance with said data, marshalling means receiving said cargoes in an arbitrary order for sending out said cargoes in accordance with the piling order from said control means, supply means for supplying said cargoes from said marshalling means to certain positions on said pallet, and piling means for piling said supplied cargoes on said pallet in accordance with said operation sequence.

4,641,272

DEVICE FOR SENSING SHEET TRANSPORT CONDITION

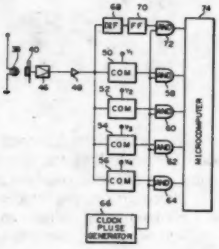
Tomio Sasaki, Kawasaki, and Yukio Noguchi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,151

Claims priority, application Japan, Apr. 5, 1983, 58-59430

Int. Cl.⁴ G06F *15/46*; B65H *23/032, 23/18*

U.S. Cl. 364—559 **8 Claims**



1. A device for sensing a transport condition of a sheet, which is being transported along a predetermined transport path, with respect to a transport direction, said device comprising:

a single sensor located in the vicinity of one of laterally opposite ends of the transport path and having a sensing surface which extends over a predetermined area, said single sensor continuously generating a detection signal coresponding to an area of said sensing surface which is occupied by the sheet while the sheet moves past the sensing surface;

a plurality of comparators each being supplied with the detection signal to compare a level of the detection signal with different reference levels which are respectively assigned to said comparators, each of said comparators continuously generating a comparison signal only for a duration in which the level of the detection signal is higher than the reference level assigned thereto;

computer means for comparing a number of the comparators which are gcnerating the comparison signals with a predetermined reference number of the comparators which generate comparison signals while the sheet is in proper transportation, and computing lateral dislocation of the sheet with respect to the transport direction and an amount of the lateral dislocation from a result of the comparison; and

a differentiator having an input connected to the single sensor and an output connected to the computer means for generating a variation rate signal which corresponds to a variation rate in the level of the detection signal output from the single sensor, the computer means being constructed to compare a first predetermined period of time for which an area of the sensing surface of the sensor occupied by the sheet while the sheet properly moves past

the sensing surface remains maximum with a duration of one of the comparison signals output from the comparators which is output for a shortest duration, and deciding that the sheet is skewed with respect to the transport direction when the first predetermined period is shorter than the duration of said one comparison output.

4,641,273

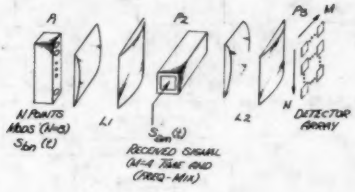
GENERAL TIME, SPACE AND FREQUENCY MULTIPLEXED ACOUSTO-OPTIC CORRELATOR

David Casasent, Pittsburgh, Pa., assignor to Teledyne Industries, Inc., Northridge, Calif.

Continuation-in-part of Ser. No. 712,555, Mar. 15, 1985, and Ser. No. 712,194, Mar. 15, 1985. This application Sep. 13, 1985, Ser. No. 775,647

Int. Cl.[4] G06G 9/00

U.S. Cl. 364—822 **7 Claims**



1. A space and frequency multiplexed, time integrating correlator comprising

a plurality (N) of light sources distributed along a first direction, each for emitting light having an intensity or amplitude responsive to a respective one of a plurality of first electric signals applied thereto;

an acousto-optic cell extending in a second direction orthogonal to said first direction and having an input transducer for creating a sound field in said cell responsive to a second electric signal consisting of a plurality (M) frequency multiplexed signals applied thereto;

a first lens means between said plurality of light sources and said acousto-optic cell for substantially uniformly illuminating said acousto-optic cell with light from each of said light sources;

a plurality (NM) of time integrating light detection means equal in number to the number (N) of said light sources times the number (M) of said frequency multiplexed signals, each for providing a signal responsive to the light incident thereto, said light detection means being arranged in an N by M array of light detection means wherein N light detection means are distributed in each of M linear arrays along said first direction and M light detection means are distributed in each of N linear arrays along said second direction; and

a second lens means between said acousto-optic cell and said plurality of light detection means to illuminate light detection means in each of said M linear arrays of N detectors with light originating from a respective one of said light sources, said second lens means also being a means for illuminating each of said M light detection means in each of said N linear arrays with light from said acousto-optic cell within a respective frequency range correponding to the frequency range of one of said frequency multiplexed signals, whereby each of said light detection means will provide a signal responsive to a respective first signal as correlated with a respective one of said frequency multiplexed signals.

4,641,274

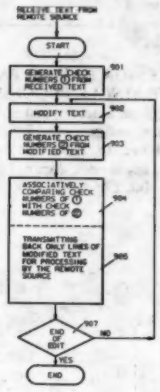
METHOD FOR COMMUNICATING CHANGES MADE TO TEXT FORM A TEXT PROCESSOR TO A REMOTE HOST

Edgar W. Swank, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 446,732, Dec. 3, 1982, abandoned. This application Aug. 19, 1985, Ser. No. 766,722

Int. Cl.[4] G06F 15/00

U.S. Cl. 364—900 **6 Claims**



6. A method of communicating changes made to text formed by lines of characters received from a remote source as electrical signals by an electronic processor to said remote source whereby said processor includes means for storing text, means for receiving, modifying, and transmitting text, and a device for inputting information, each character being represented within the processor and the source as a coded number, comprising the steps of:

(a) generating by said processor and storing in said storing means a respective checking number corresponding to each one of a plurality of lines of characters received from the source, each checking number being formed from the coded numbers by recursively combining and ringshifting said numbers in a predetermined order;

(b) modifying by the processor the received text to form a body of modified lines based upon the information input through the inputting device;

(c) generating by the processor a checking number of each line of modified text; and

(d) associatively comparing by said processor the checking numbers of consecutive counterpart lines of the modified text with those of the received text and transmitting by said processor back to said remote source the entire text of only those lines which have been modified as denoted by said lines having checking numbers mismatching those of the received text thereby to minimize communication of changes made to the text between the remote source and processor, said step of associatively comparing including the steps of:

(1) comparing the checking numbers of consecutive counterpart lines of the modified and received texts and continuing said comparison linearly until the first mismatch is detected;

(2) performing reciprocal comparison by comparing the next consecutive line checking number of the modified text to the preceding consecutive line checking numbers of the received text and comparing said consecutive line checking number of the received text with the next consecutive line checking numbers of the modified text, the reciprocal comparison continuing until a first match is detected;

(3) repeating steps (1) and (2) until the lines of the received and modified texts become exhausted; and

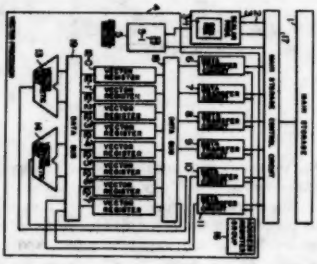
(4) transmitting to said remote source (a) the entire text of those lines which have been modified as denoted by a mismatch of corresponding checking numbers, and (b) indications of each run of at least a predetermined number of consecutive lines in the modified text whose checking numbers match checking numbers in the received text, said indications representing counts of lines of the received text which have not been modified or lines of received text which have been deleted.

4,641,275

VECTOR PROCESSOR HAVING PAIR PROCESS MODE AND SINGLE PROCESS MODE

Yasuhiko Hatakeyama, Hadano, and Shigeo Nagashima, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,521
Claims priority, application Japan, Mar. 2, 1983, 58-34197
Int. Cl.[4] G06F 9/00, 9/28
U.S. Cl. 364—900 4 Claims



1. A vector processor for carrying out vector instructions which designate a plurality of vectors by performing operations on vector elements belonging to the vectors comprising:

a main storage;

a plurality of vector registers;

means, including a plurality of vector data transfer circuits, for performing data transfer between said main storage and said vector registers;

means, including a plurality of vector arithmetic units coupled to said vector registers and each capable of performing the same arithmetic operations, for carrying out vector instructions by performing arithmetic operations on vector data received from said vector registers and sending the results to a vector register;

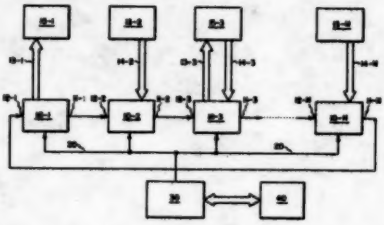
detecting means for detecting whether a vector instruction to be carried out is a first type of vector instruction designating operations between vector elements having the same element number or a second type of vector instruction designating operations between vector elements having different element numbers; and control means responsive to said detecting means for controlling the execution of a vector arithmetic operation in a first or second control mode in response to the type of the vector instruction detected by said detecting means, wherein said first control mode includes dividing vector registers and vector arithmetic units into a plurality of sets and dividing vector data to be operated on by a vector arithmetic instruction into a plurality of vector data portions, thereby to process the plurality of vector data portions in parallel using said plurality of sets, and said second control mode includes storing each vector data in corresponding vector registers, thereby to perform the vector arithmetic operation using the vector arithmetic units which operate together with said vector registers.

4,641,276

SERIAL-PARALLEL DATA TRANSFER SYSTEM FOR VLSI DATA PATHS

Robert J. Dunki-Jacobs, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,609
Int. Cl.[4] G06F 13/40
U.S. Cl. 364—900 4 Claims



1. Apparatus for transferring a multi-bit data word from a source functional unit to a destination functional unit, said units being two of a plurality of functional units on the same semiconductor chip, each said unit having a unique address, said apparatus comprising:

a plurality of multi-stage registers, each such register coupled to a respective one of said units, said registers transferring said data in parallel to and from said units, said registers located on said chip and serially connected to each other with the input to the first register coupled to the output of the last register to form a closed loop serial data path;

control means coupled to said registers and responsive to the addresses of said source and destination functional units for providing control signals to sequentially cause a parallel transfer of said data word from said source unit to its respective multi-stage register, a shifting of said data word through said registers in a manner to move said data word to the respective register of said destination unit, and a parallel transfer of said data word to said destination unit;

wherein said control means includes:

modulus m counting means for counting the bit displacement of said data word while said data word is shifted through said registers of said data path; and

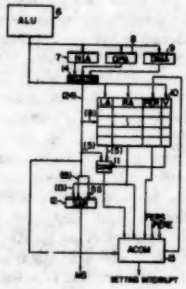
a controller coupled to said counting means for providing said control signals to said registers and for determining the number of shifts necessary to transfer said data word from said respective multi-stage register of said source unit to said respective multi-stage register of said destination unit by presetting said counting means to said source address and incrementing said counting means upon each shift of one bit of said data word until the count of said counting means is equal to said destination address whereupon said data word has been shifted the necessary number of bits to move said data word from said respective multi-stage register of said source unit to said respective multi-stage register of said destination unit.

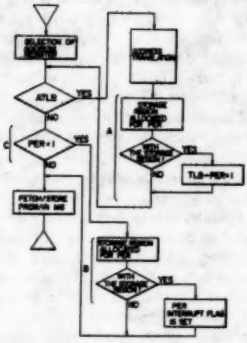
4,641,277

SYSTEM FOR DETECTING ACCESS TO STORAGE

Kiyoshi Yata, and Hideo Sawada, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,199
Claims priority, application Japan, Nov. 12, 1982, 57-197495
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 3 Claims





1. A data processing apparatus comprising:

storage means having a plurality of storage locations divided into a plurality of pages for storing information;

address generating means for generating a logical address having a first address portion representing a logical page and a second address portion representing an internal address of a storage location on the page;

an address translation lookaside buffer coupled to said address generating means for translating said logical address into a real address which represents a storage location of said storage means, said address translation lookaside buffer having a plurality of entries each of which stores a logical page address and real page address corresponding to the first address portion of the logical address;

means connected to said address translation lookaside buffer for obtaining said real page address from an entry of said address translation lookaside buffer which stores said logical page address coinciding with said logical page address provided by said address generating means and for outputting the real page address obtained from said entry and the second address portion of said logical address as said real address; and

address comparison means for detecting whether said address outputted by said translation lookaside buffer or said logical address identifies a storage location within a predetermined storage area of said storage means;

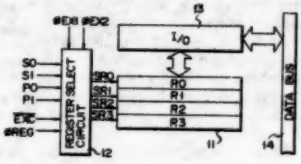
wherein each entry of said address translation lookaside buffer further stores identification information indicating whether said real page address or said logical page address stored in said entry includes said predetermined storage area in said storage means, and further including means for activating said address comparison means only when the identification information read out from an entry of said address translation lookaside buffer as a result of the translation of a logical address thereby indicates that said real address corresponding to the entry includes said predetermined storage area.

4,641,278

MEMORY DEVICE WITH A REGISTER INTERCHANGE FUNCTION

Tomotaka Saito, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1984, Ser. No. 666,449
Claims priority, application Japan, Oct. 31, 1983, 58-203837
Int. Cl.[4] G11C 13/00
U.S. Cl. 365—78 6 Claims



1. A memory device with a register interchange function, comprising:

a register file having a plurality of registers each of which is selectable responsive to respective select signals; and

a register selecting circuit for generating said select signals having a register select mode and a select signal interchange mode, the register selecting circuit including:

means for decoding register select data during the register select mode and decoding register interchange data during the select signal interchange mode by producing signals with levels complementary to those of the respective register select and register interchange data;

first comparing means for comparing register interchange data of different registers in the select signal interchange mode;

first memory means provided for each register having predetermined contents in an initial state and being responsive to results of the comparison effected by the first comparing means for changing the contents of said each register;

second comparing means provided for each register which compares in the register select mode the signals from the decoder means and the contents in the first memory means and provides the result of the comparison to the corresponding register as a select signal, and which compares in the select signal interchange mode the contents in the first memory means with the signals from the decoder means;

second memory means, provided for each of the registers, for storing the output of the second comparing means in the select signal interchange mode; and

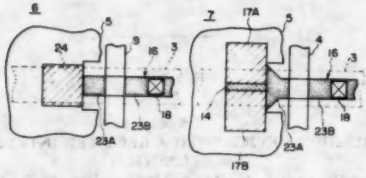
control means provided for each of the registers to update, in accordance with the data stored in the second memory means, the contents in the first memory means on the basis of the output of the first comparing means.

4,641,279

SEMICONDUCTOR MEMORY DEVICE HAVING A DUMMY CELL AND A MEMORY CELL WHICH IS TWICE THE SIZE OF THE DUMMY CELL

Katsutaka Kimura, Sagamihara; Ryoichi Hori, Tokyo; Kiyoo Ito, Higashikurume, and Hideo Sunami, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1984, Ser. No. 587,080
Claims priority, application Japan, Mar. 7, 1983, 58/35812
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—149 **5 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cells connected to a plurality of data lines, respectively, and having first capacitors for storing information;

a plurality of dummy cells connected to said data lines, respectively, and having second capacitors having a capacitance which is substantially half of a capacitance of said first capacitors; and

means connected to selected first and second data lines of said data lines, for differentially detecting signals on said first and second data lines when one of said memory cells connected to said first data line is selected and one of said dummy cells connected to said second data line is selected,

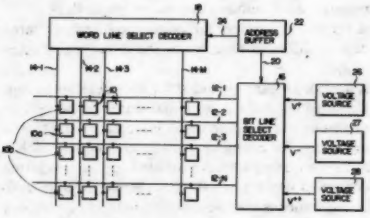
said first capacitor being comprised of two capacitors each having the same structure as said second capacitor and connected in parallel with each other.

4,641,280

HIGH-DENSITY SEMICONDUCTOR MEMORY DEVICE WITH CHARGE-COUPLING MEMORY CELLS

Fumio Horiguchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1984, Ser. No. 645,558
Claims priority, application Japan, Sep. 9, 1983, 58-165902
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—183 **9 Claims**



7. A semiconductor memory device of the current readout type comprising:

(a) a semiconductive substrate having a first conductivity type;

(b) charge-coupling memory cells which are arranged like a matrix over said substrate and are respectively connected to word lines and bit lines which cross substantially perpendicularly with each other, each of said charge-coupling memory cells having,

(b1) electrically floating layer which capacitively stores digital data supplied from the corresponding bit line in the data writing mode,

(b2) a first field effect transistor of a second channel conductivity type having a source to which a first voltage at its fixed level is always applied, a gate connected to the corresponding word line and a drain

(b3) a second field effect transistor of the first channel conductivity type which commonly uses said electrically floating layer as its drain, said second field effect transistor having a gate connected to the corresponding word line and a channel region whose impurity concentration is higher than that of said substrate,

(b4) a junction type field effect transistor of the first channel conductivity type which is connected with the drain of said first field effect transistor and the corresponding bit line, commonly uses said electrically floating layer as its gate and performs the switching operation in accordance with the data storage in said electrically floating layer in the data reading mode, thereby, when it is made conductive, transmitting said first voltage of said first field effect transistor to the corresponding bit line, and

(b5) a capacitor formed by said electrically floating layer and connected to said junction type field effect transistor; and

(c) first decoder means, formed on said substrate so as to be connected to said word lines, for, in the data writing mode, designating one word line which is connected to one selected cell to which data is written and for applying a second voltage such as to make the first field effect transistor included in said selected cell conductive and for allowing the carriers corresponding to the data content of the electrically floating layer included in said selected cell to flow out to said substrate through said second conductive transistor, whereby after the data content of said electrically floating layer is cleared, digital data which is newly supplied from said corresponding bit line is stored in said selected cell; and

(d) a second decoder means which is formed over said substrate so as to be connected to said bit lines and which, in the data writing mode, applies a third voltage so as to forcibly make second field effect transistors included in the nonselected cells connect to the same word line as that of said selected nonconductive cell, thereby preventing the data contents of the electrically floating layers included in said nonselected cells from being cleared.

4,641,281

DYNAMIC RANDOM ACCESS MEMORY WITH HIDDEN REFRESH CONTROL

Koichiro Mashiko; Michihiro Yamada, both of Takarazuka; Kazutami Arimoto, Itami; Hiroshi Miyamoto, Toyonaka; Toshifumi Kobayashi, and Yoshikazu Morooka, both of Itama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,675
Claims priority, application Japan, Aug. 26, 1983, 58-156701
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **1 Claim**

1. A dynamic random access memory comprising:

at least one memory cell;

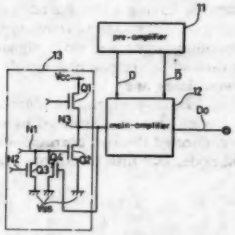
pre-amplifier means for amplifying data which is read out from a memory cell accessed by an address signal;

main-amplifier means for amplifying an output of the pre-amplifier and outputing an amplified signal;

driver circuit means for outputting a driving signal for driving the main-amplifier means,

said driver circuit means including a first and a second transistor, wherein a drain of the first transistor is connected to a node corresponding to an output terminal of the driver circuit, with a source of the first transistor being earthed

and with a gate thereof being connected to a drain of the second transistor, and wherein a gate of the second transistor is connected to the node with the source thereof being earthed.



4,641,282

MEMORY SYSTEM

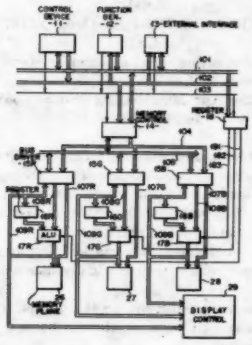
Shouji Ounuma, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 24, 1983, Ser. No. 497,676

Claims priority, application Japan, May 31, 1982, 57-92861

Int. Cl.⁴ G11C *7/00*; G09B *1/28*

U.S. Cl. 365—189 **10 Claims**



1. A memory system comprising:

a plurality of memory planes for storing picture data;

memory control means for controlling writing and reading data from said plurality of memory planes;

a plurality of operation means coupled in one-to-one relationship with said memory planes for performing logical arithmetic operations on data read from said respective memory planes thereby allowing said logical arithmetic operations to be performed on all of said memory planes simultaneously; and

a plurality of first register means coupled in one-to-one relationship with said operation means for holding data from said respective planes.

4,641,283

CIRCUIT FOR READING BIPOLAR STORAGE CELLS

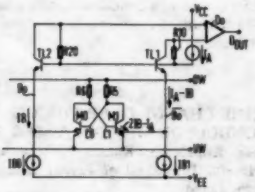
Wilhelm Wilhelm, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1983, Ser. No. 514,190

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227121

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—190 **3 Claims**



1. Circuit for reading bipolar storage cell, comprising a storage element formed of two fed-back inverters, an upper and a lower word line, each of said inverters being formed of a multi-emitter transistor, each having a first and second emitter, and a load element connected between the upper word line and the collector of a respective one of said multi-emitter transistors, two complementary bit-lines each being connected to the first emitter of a respective one of said multi-emitter transistors, the second emitter being connected to said lower word line, a first potential source, two bit-line current sources each being connected between said first potential source and a respective one of said complementary bit lines, a differential amplifier having two inputs, two read transistors each having a collector-emitter path connected between a respective one of said inputs of said differential amplifier and a respective one of said complementary bit-lines, a second potential source, a read-current source connected between the base of said read transistors and said second potential source, and two resistance elements each being connected between the collector of a respective one of said read transistors and said read current source.

4,641,284

SIGNAL TRANSMISSION CIRCUIT FOR A STORAGE DEVICE

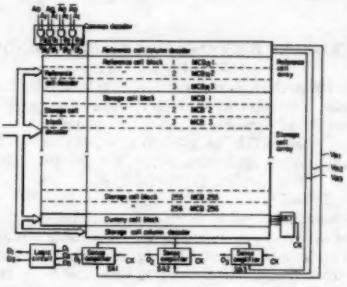
Yasuo Suzuki, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 29, 1985, Ser. No. 696,142

Claims priority, application Japan, Jan. 31, 1984, 59-015590

Int. Cl.⁴ G11C *7/02*

U.S. Cl. 365—210 **4 Claims**



1. A signal transmission circuit comprising:

a common output terminal; and

a plurality of input circuits connected to said common output terminal, each said input circuit comprising,

an input terminal;

a buffer circuit; and

a metal insulator semiconductor (MIS) transistor, wherein the source-drain regions of said MIS transistor are connected to said input terminal and said output terminal,

said buffer circuit being connected between said input terminal and the gate electrode of said MIS transistor, wherein said buffer circuit is driven by an input signal selectively applied thereto, wherein said MIS transistor is driven by said buffer circuit to a conductive state whereby said input signal is transmitted from said input terminal to said output terminal.

4,641,285

LINE CHANGE-OVER CIRCUIT AND SEMICONDUCTOR MEMORY USING THE SAME

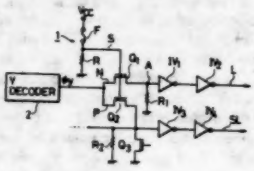
Yukio Sasaki, Kokubunji; Kotaro Nishimura, Kodaira, and Osamu Minato, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 640,508

Claims priority, application Japan, Oct. 26, 1983, 58/199022

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—210 **16 Claims**



1. A line change-over circuit, comprising:

a first node to which a first signal to be transmitted is supplied;

a first transfer gate provided between said first node and a second node and operating as a switch according to a transfer signal;

a second transfer gate provided between said first node and a third node and operating as a switch in a complementary manner to said first transfer gate according to said transfer signal;

a first switch element coupled to said second node and turning said second node to a first fixed potential when said first transfer gate is kept off, said first switch element being operated as a switch according to said transfer signal; and

a second switch element coupled to said third node and turning said third node to a second fixed potential when said first signal is supplied to said second node.

4,641,286

AUXILIARY DECODER FOR SEMICONDUCTOR MEMORY DEVICE

Kazuhiro Shimotori; Kazuyasu Fujishima; Hideyuki Ozaki, and Hideshi Miyatake, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 581,000

Claims priority, application Japan, Feb. 17, 1983, 58-26458

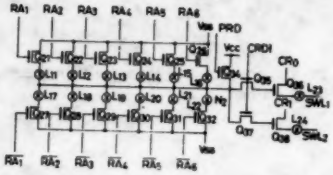
Int. Cl.⁴ G11C *8/00*

U.S. Cl. 365—230 **1 Claim**

1. A semiconductor memory device comprising:

a line decoder, said line decoder comprising a plurality of MOS first transistors having sources connected to a ground line, drains connected to a first node, and gates receiving respective address signals; an MOS second transistor having a source coupled to said first node, a drain coupled to a power source terminal, and a gate receiving a precharge signal; a plurality of MOS third transistors having drains connected to said first node and gates receiving a separation signal; a plurality of MOS fourth transistors, in a number equal to the number of said third transistors, having gates connected to sources of corresponding ones of said third transistors, drains receiving corresponding word line drive signals, and sources connected through corresponding fusible links to corresponding word lines; and

an auxiliary line decoder comprising a plurality of MOS fifth transistors having sources connected to said ground line and drains connected through corresponding fusible links to a second node, said fifth transistors being provided in



pairs of which the two transistors of each pair receive respective inverted and uninverted address signals; an MOS sixth transistor having a source connected to said second node, a drain connected to said power source terminal and a gate receiving said precharge signal; a plurality of MOS seventh transistors having drains connected to said second node and gates receiving said separation signal; a plurality of MOS eighth transistors, in a number equal to the number of said seventh transistors, having gates connected to sources of corresponding ones of said seventh transistors, drains receiving corresponding word line drive signals, and sources connected through corresponding fusible links to corresponding auxiliary word lines.

4,641,287

METHOD FOR LOCATING AN ON-BOTTOM SEISMIC CABLE

Walter P. Neeley, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,089

Int. Cl.⁴ G01V *1/38*

U.S. Cl. 367—19 **1 Claim**

1. A method for determining the location of an ocean bottom cable having acoustic pulse detectors comprising the steps of:

firing an acoustic pulse source at a first location;

producing a first response thereto by a first acoustic pulse detector located on the said cable;

determining the distance between said first location and said first acoustic pulse detector, said distance defining a spherical surface;

firing said acoustic pulse source at a second location;

producing a second response thereto by said first acoustic pulse detector;

determining the distance between said second location and said first acoustic pulse detector, said distance defining a spherical surface;

defining a line of possible loctions of said first acoustic pulse detector by the points common to said distance between said first location and said first acoustic pulse detector and to said distance between said second location and said first acoustic pulse detector;

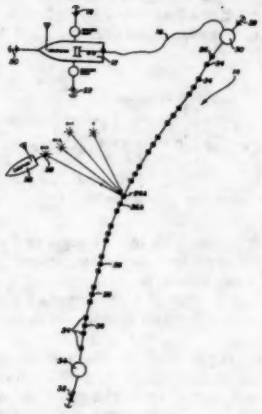
firing said acoustic pulse source at a third location;

producing a third response thereto by said first acoustic pulse detector;

determining the distance between said third location and said first acoustic pulse detector, said distance defining a spherical surface;

identifying two possible locations of said first acoustic pulse detector by the points common to said line of possible locations of said first acoustic pulse detector and said distance between said third location and said first acoustic pulse detector; and

eliminating one of said two possible locations as being above sea level;



providing a depth detector in close proximity to said first acoustic pulse detector;

determining the depth of said first acoustic pulse detector; and

confirming the location of said first acoustic pulse detector by eliminating locations of said line of possible locations inconsistent with said depth of said first acoustic detector.

4,641,288

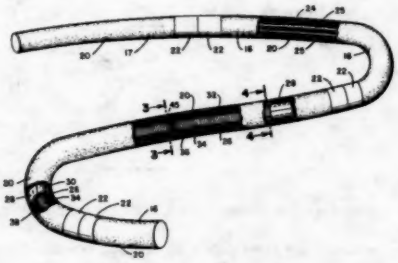
RIBBON TERMINATION MEMBER

George A. McGowan, Westminster, and Robert L. Kaplan, San Diego, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 7, 1985, Ser. No. 796,050

Int. Cl.⁴ G01V *1/38*

U.S. Cl. 367—20 **14 Claims**



1. A strength member arrangement for a towed sonar array comprising:

an elongated flexible strength member extending within and along the length of a sonar array module for carrying the tensile load of said module from one end thereof to the other, the ends of said elongated flexible strength member being joined together to form one continuous loop comprising a first end disposed towards one end of said module, and a second end disposed towards said other end of the module, ; and

rigid termination members coupled to each end of said loop.

4,641,289

PROCESS AND DEVICE FOR TRANSMITTING INFORMATION OVER A DISTANCE

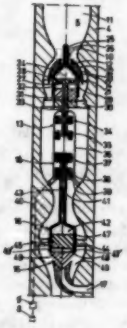
Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Norton Christensen, Inc., Salt Lake City, Utah

Filed Jul. 6, 1981, Ser. No. 280,614

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028813

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 367—85 **1 Claim**



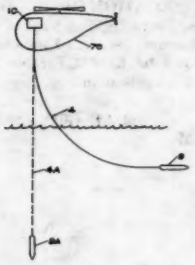
1. Device for transmitting information over a distance from a bore hole to the surface of the earth during operation of a boring implement which encompasses a rotary drill tool, a drill string and a pump to convey downward flowing flushing liquid, in which the normal working pressure, as increased in pressure by the pump, which exists in a subterranean transmission region of the drill string is altered to form a series of pressure pulses, which is equivalent to a pulse code of digital signals containing the information to be transmitted over a distance and which is sensed at a subterranean region and evaluated at the surface of the earth, in which the pressure change is undertaken by means of a temporally limited, alternating increase in the pressure of the flushing liquid from a predetermined normal operating initial pressure up to a predetermined maximum pressure and reduction of the pressure of the flushing liquid to a pressure value between the maximum pressure and a predetermined minimum pressure which falls below the initial pressure, characterized by the fact that, the initial pressure starts out as the normal working pressure of the flushing liquid in the transmission region of the drill string, the flow channel available to the flushing liquid in the drill string is reduced by a first valve to achieve a pressure increase and by the fact that a direct flow connection between the drill string and the annular space which surrounds it in the bore hole is established by a second valve to achieve pressure reduction below the original pressure, in a predetermined sequential manner, said first valve controlling the amount of flushing liquid flowing through a parallel bypass path within the drill string, both valves being provided with pressure balancing surfaces, both valves supported coaxially in the central region of the flow channel of the drill string and being positionable in intermediate position between fully open and fully closed.

4,641,290

LOW FREQUENCY PORTABLE LIGHTWEIGHT SONAR SYSTEMS AND THEIR METHOD OF DEPLOYMENT FOR GREATLY INCREASING THE EFFICIENCY OF SUBMARINE SURVEILLANCE OVER LARGE AREAS

Frank Massa, Cohasset, Mass., and Donald P. Massa, 280 Lincoln St., Hingham, Mass. 02043, assignors to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass.

Filed Nov. 13, 1984, Ser. No. 670,206
Int. Cl.[4] G01S *3/80*; H04R *1/02*
U.S. Cl. 367—106 **19 Claims**



14. An improved method for achieving high-speed high-efficiency long-range towed sonar surveillance over very large areas including the following steps:

1. Attach by tow cable to a high-speed over-water vehicle an audio frequency towable sonar system capable of operating at a frequency within the approximate range 2 kHz to 5 kHz and contained within a small cylindrical streamlined housing less than one wavelength in diameter at the frequency of operation and capable of detecting the range and bearing of submarine targets within a radius in excess of 10,000 meters in a plane at right angles to the longitudinal axis of the cylindrical structure;
2. With the over-water vehicle at rest or drifting slowly and the longitudinal axis of the towed cylindrical sonary housing held approximately vertical in the water, making several sonar searches over a period of a few minutes to determine the presence of any submarine targets within the radius of detection of the sonar system;
3. Apply power to the over-water vehicle and with the sonar still in tow proceed at high speed to a distant point removed approximately by 50% to 100% of the maximum range of detection of the sonar system from the last sonar search point;
4. Cut power to the over-water vehicle and when the speed has decreased sufficiently so that the longitudinal axis of the cylindrical sonar housing is approximately vertical in the water repeat making several sonar searches over a period of a few minutes and then proceed again at high speed to the next distant point of surveillance.

4,641,291

PHASED ARRAY DOPPLER SONAR TRANSDUCER

Robert L. Simmons, Sr., San Diego, and Clifton M. Wyant, Santee, both of Calif., assignors to Ametek, Inc., El Cajon, Calif.

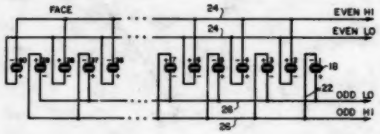
Filed Feb. 19, 1985, Ser. No. 702,798
Int. Cl.[4] H04B *1/06, 1/02*; H04R *17/00*; H01L *41/04*
U.S. Cl. 367—157 **10 Claims**

1. An underwater transducer, comprising:

a plurality of rectangular planar staves made of a material selected from the group consisting of piezoelectric material and magnetostrictive material, each stave being polarized across its width and having positive and negative longitudinal side edges;

means for supporting the staves in parallel relationship with one longitudinal side edge of each stave extending in a common plane defining an active face, the staves being mechanically decoupled so that they can freely expand and contract across their widths independent of each other, and the staves being oriented such that every other adjacent pair of longitudinal side edges in the active face are positive and the interspersed adjacent pairs of longitudinal side edges in the active face are negative;

means for providing electrical connection to the positive and negative longitudinal side edges of each of the staves, including first and second even buses and first and second



odd busses, the positive and negative longitudinal side edges of every other stave being connected to the first and second even busses, respectively, and the positive and negative side edges of the interspersed staves being connected to the first and second odd busses, respectively; and

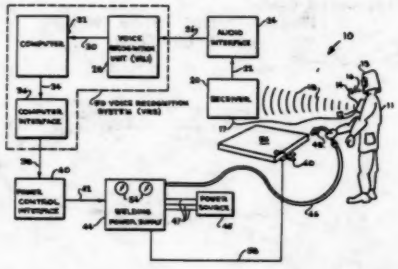
an acoustic center of each longitudinal side edge in the active face being spaced a distance of approximately one-half wavelength of a predetermined operating frequency apart from and acoustic center of an immediately adjacent longitudinal side edge in the active face.

4,641,292

VOICE CONTROLLED WELDING SYSTEM

George Tunnell, 667 Sandy Hook Ct., Foster City, Calif. 94404; Charles L. Pomernacki, 4162 Barner Ave., Oakland, Calif. 94602, and Jack P. Gregg, 2371 Lockwood Ave., Fremont, Calif. 94538

Continuation-in-part of Ser. No. 506,101, Jun. 20, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 789,732
Int. Cl.[4] G10K *11/00*; B23K *9/10*
U.S. Cl. 367—198 **24 Claims**



1. Apparatus for a human voice controlled welding system, comprising:

a transmitter for transmitting an acoustic command signal from the human operator;

a receiver for receiving the transmitted command signal;

a voice recognition unit containing previously stored voice recognition information, for comparing the received command signal with the stored information to produce a control signal; and

a welding power supply connected to a welding torch and responsive to the control signal from the voice recognition unit to vary the power output to the torch as orally commanded by the operator.

4,641,293

CASSETTE TAPE PLAYER COMBINED WITH A RADIO RECEIVER WHICH HAS MULTIPLE PUSH BUTTONS SUCH THAT THE STOP PUSH BUTTON CAN BE USED TO TURN OFF EITHER THE CASSETTE TAPE PLAYER OR THE RADIO RECEIVER

Toshio Komuro, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,861
Claims priority, application Japan, Feb. 8, 1983, 58-20328
Int. Cl.[4] G11B 31/00
U.S. Cl. 369—6 5 Claims

1. A locking and releasing mechanism for a cassette tape player combined with a radio receiver comprising;

a tape playing mechanism operating as a cassette tape player,

a radio signal receiving device functioning a radio receiver,

a plurality of player control buttons connected with said tape playing mechanism to be used for selecting an operation mode of said tape playing mechanism,

a radio control button connected with said radio signal receiving device to be used for causing the radio signal receiving device to be operative,

a stop button provided in common to both the tape playing mechanism and the radio signal receiving device to be used for stopping either one of said tape playing mechanism and said radio signal receiving device from operating, and

a locking and releasing structure which is fitted to be rotatable against a boss on a chassis and having a first portion including a plurality of arms extending radially which engages with one of said player control buttons and a radio control button to be kept in the manipulated and a second portion which engages with said stop button to release one of said player control buttons and radio control button to be kept in the manipulated,

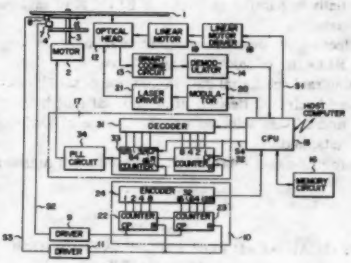
said locking and releasing structure is operative to keep said radio control button in the manipulated position and directly release one of said player control buttons without operating said stop button from the manipulated position when said radio control button is manipulated under the situation in which said one of said player control buttons has been kept in the manipulated position, and (said locking and releasing structure) is also operative to keep one of said player control buttons in the manipulated position and directly release radio control button without operating said stop button from the manipulated position when one of said player control buttons is manipulated under the situation in which said radio control button has been kept in the manipulated position.

4,641,294

METHOD AND APPARATUS FOR PERFORMING A MEMORY OPERATION ON A FIXED LENGTH BLOCK OF DATA ON A MEMORY DISK

Tomohisa Yoshimaru, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 27, 1984, Ser. No. 625,365
Claims priority, application Japan, Jun. 30, 1983, 58-119357
Int. Cl.[4] G11B 7/007
U.S. Cl. 369—32 16 Claims



16. A method for performing a memory operation on a block of data on a memory disk, comprising the steps of:

addressing all areas on the memory disk in terms of one of a plurality of spiral tracks thereon, and one of a plurality of sectors within the spiral track, each sector being a predetermined angular extent of a spiral track;

storing in a memory a correspondence between block numbers and sectors, tracks, and speed to allow all memory blocks to have a same storage capacity;

determining a memory block to be addressed;

reading a sector, track, and speed from said memory corresponding to said addressed block;

calculating a start address and sector extent sector for said addressed block;

addressing said addressed block; and

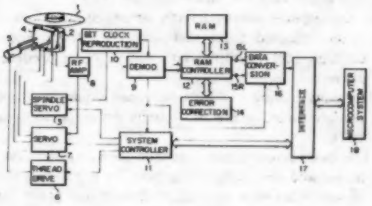
rotating said memory disk at said speed read in said reading step.

4,641,295

DISC PLAYBACK APPARATUS

Shunsuke Furukawa; Tadao Suzuki, both of Tokyo, Japan, and Marinus J. B. M. Monen, Colorado Springs, Colo., assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,265
Claims priority, application Japan, Sep. 1, 1983, 58-161514
Int. Cl.[4] G11B 21/10
U.S. Cl. 369—32 24 Claims



1. A method for arranging digital data having definable informational units on a recording medium disc for subsequent access of specific informational units and playback thereof by disc playback apparatus including the steps of:

recording main digital data in a track on a disc;

recording subdigital data in the same track on said disc as said main digital data and including in said subdigital data data to selectively reproduce said main digital data;

selecting a unit of change of said informational units of said main digital data as indicated by said subdigital data;

playing back at least a part of a selected recorded track of said disc;

forming a plurality of FRAMEs from said main digital data and corresponding subdigital data;

arranging a predetermined number of said FRAMEs sequentially in parallel to form one BLOCK of said main digital data;

selecting a desired informational unit of one of said BLOCKs of said main digital data;

using said subdigital data in said one of said blocks to access said selected desired informational unit having a resolution of said selected unit of change of said main digital data; and

outputting said reproduced accessed main digital data.

4,641,296

OPTICAL HEAD FOR INFORMATION RECORDING APPARATUS

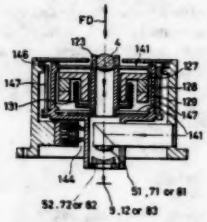
Katsumi Mizunoe, Yokohama; Junichi Yanai, and Kiyoshi Kimoto, both of Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,655

Claims priority, application Japan, Apr. 28, 1983, 58-73908; Jun. 16, 1983, 58-108315

Int. Cl.⁴ G11B *7/095*

U.S. Cl. 369—46 **14 Claims**



11. An optical head for recording and/or reading information from at least one information recording track on a recording carrier comprising:

(a) means for producing a beam of radiation:

(b) objective lens means for condensing said beam of radiation on said recording track, said objective lens means being positioned to pass therethrough said beam of radiation reflected from said recording track:

(c) first optical means fixedly arranged to condense said beam reflected from said recording track and passed through said objective lens means on a predetermined plane;

(d) means having a detection plane coincident with said predetermined plane and fixedly arranged to detect said beam:

(e) second optical means arranged between said first optical means and said detecting means for producing the circle of least confusion on said predetermined plane from said beam passing through said second optical means when the distance between said recording track and said objective lens means is equal to the focal length of said objective lens means; and

(f) drive means responsive to said detecting means to displace said objective lens means and said second optical means in the same direction.

4,641,297

DEVICE FOR MOUNTING AN INFORMATION CARRYING DISC MEMBER

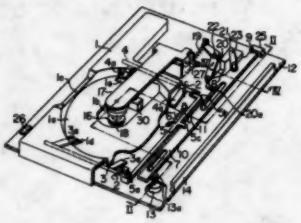
Masayoshi Watanabe, Toyokawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 8, 1984, Ser. No. 608,163

Claims priority, application Japan, May 9, 1983, 58-79400

Int. Cl.⁴ G11B *17/04*

U.S. Cl. 369—75.2 **3 Claims**



1. A device for mounting an information carrying disc member comprising:

a chassis having a front portion and a rear portion;

a movable base having a recessed portion with a diameter slightly larger than the diameter of said information carrying disc member, and being mounted movable on said chassis so that said base may be movable from the front portion to the rear portion of the chassis;

a disc-member raising and lowering means for raising and lowering said information carrying disc member within said recessed portion;

a motor mounted on said chassis;

a rack mounted movably on said movable base so that said rack may be moved from the front portion to the rear portion of said chassis, and being driven by said motor so that said rack may move said movable base from the front portion to the rear portion of the chassis;

a latch mounted movable on said movable base, and engaged with an end portion of said rack, said latch being mounted rockably on said movable base so as to rock in a direction away from said end portion of said rack when said latch abuts against said latch guide;

a latch guide mounted on said chassis and adapted to abut against said latch so as to disengage said latch from said rack when said information carrying disc member is moved up to a position adjacent a turntable in response to movement of said rack, thereby terminating movement of only said movable base;

linkage means for lowering said information carrying disc member onto said turntable in response to the termination of the movement of said movable base;

a clamper arm disposed adjacent to said turntable and rotatably supporting a clamper arranged to face said turntable, said clamper being supported at a raised position at which said clamper is spaced apart from said turntable; and

a control means for lowering said clamper arm in relationship with further movement of said rack, thereby causing said information carrying disc member to be urged against said turntable by said clamper and fixedly held in place thereon.

4,641,298

AUTO LOADING DISC PLAYER

Yuji Ikedo, and Takahiro Okajima, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,402

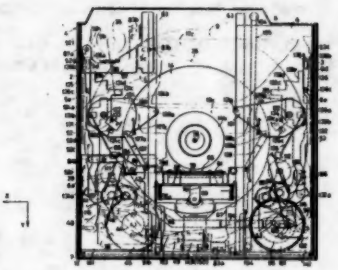
Claims priority, application Japan, Feb. 2, 1958, 58-18551

Int. Cl.⁴ G11B *25/04, 1/00, 3/60, 17/02*

U.S. Cl. 369—77.1 **2 Claims**

1. In an auto loading disc player of a type including a housing having a slot to receive a disc therein, player means dis-

posed in said housing, and drivable disc carrier means for carrying said disc close to a predetermined playing position, the improvement comprising: means defining a carrier path, a pair of drivable guide means disposed bilaterally of said carrier path for said disc for guiding said disc along said carrier path, and a disc diameter discriminator mechanism for engaging with the periphery of said disc to automatically discriminate between diameters of discs while said disc is being moved by said carrier means towards said playing position and at the



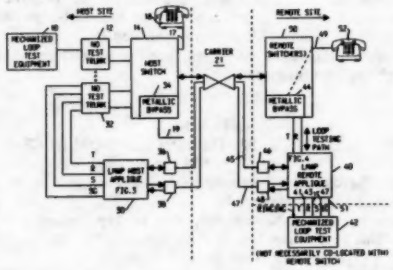
same time when said guide means guides said disc, said disc diameter discriminator mechanism comprising means for driving said guide means in such a manner that a distance between said guide means corresponds to the outer diameter of said disc, said guide means engaging with the periphery of said disc during its conveyance to thus cause said disc to cooperate with said disc carrier means for guiding said disc, said disc carrier means releasing said disc from engagement with said guide means during the period of time when said disc is played.

4,641,299

MECHANIZED LOOP TESTING USING A LOCAL METALLIC ACCESS PORT

Kyran B. Kemper, Mendham, and Robert W. Vetter, Jr., Morristown, both of N.J., assignors to AT&T Company and AT&T Bell Laboratories, both of Murray Hill, N.J.

Filed Sep. 21, 1984, Ser. No. 652,640
Int. Cl.[4] H04J *1/16, 3/14*
U.S. Cl. 370—15 **14 Claims**



1. Apparatus for interconnecting a mechanized loop test equipment with any one of a plurality of telephone loops, one end of said telephone loops being terminated at a remote telephone switch, the other end of said telephone loops being connected to terminal equipment, said remote telephone switch being inter-connected with a host telephone switch via a carrier system, the distance between said host switch and said terminal equipment exceeding a predetermined threshold value, said apparatus comprising

a remote applique circuit, located at said remote switch, for providing a metallic path between said mechanized loop test equipment and said remote switch and for repeating signals between said mechanized loop test equipment and a host applique circuit, the distance between said terminal equipment and said mechanized loop test equipment being less than said predetermined threshold value, and

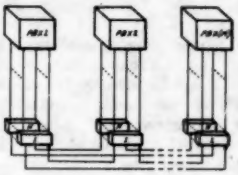
said host applique circuit, located at said host switch, for providing a path between said mechanized loop test equipment and a no-test trunk circuit located at said host switch, and for repeating signals between said no-test trunk and said remote applique circuit.

4,641,300

DIGITAL TIE LINE

Walter K. Wurst, Wellington, Canada, assignor to ITT Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,374
Int. Cl.[4] H04J *1/16, 3/02*; H04L *27/10*
U.S. Cl. 370—16 **17 Claims**



1. A digital tie line for digital communication systems, comprising;

means, coupled to a system bus and an external bus of said systems, for directing signals between each of said buses, comprising means for associating time slot assignments of said signals between said buses,

means, connected to said directing means, for controlling said directing means,

means for serializing system bus signals prior to directing said serialized system bus signals onto said external bus,

means for Manchester encoding said serialized system bus signals for insertion onto said external bus,

means for Manchester decoding external bus signals prior to directing said Manchester decoded external bus signals onto said system bus,

means for parallelizing said Manchester decoded external bus signals for insertion onto said system bus, and

means, coupled to said directing means, for providing a bypass of said external bus, in response to the absence of a dc component of said Manchester encoded serialized system bus signals provided from said Manchester encoded means, by providing a direct path around said digital tie line for external bus signals of one or more other digital tie lines coupled to said external bus.

4,641,301

TELECOMMUNICATION SWITCHING SYSTEM AND PRIORITY ARRANGEMENT USED THEREIN

Francoise C. G. Van Simaeys, Brussels; Anna M. C. Leurs, Kessel, both of Belgium; Daniel C. Upp, Southbury, Conn.; Alan J. Lawrence, Stratford, Conn., and John M. Cotton, East Norwalk, Conn., assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 15, 1985, Ser. No. 701,904
Claims priority, application Belgium, Feb. 21, 1984, 2/60342
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **25 Claims**

1. A telecommunication switching system, comprising:

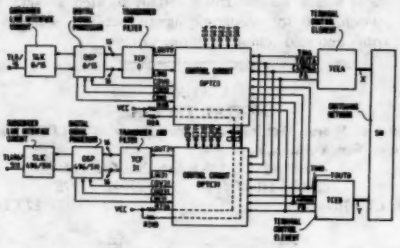
a plurality of terminal circuits providing control data;

a common control circuit including first means for processing control data collected from said terminal circuits;

first time division multiplex links coupling said terminal circuits with said common control circuit;

a processor controlled interface circuit;

second time division multiplex links coupling said processor controlled interface circuit with said common control circuit; and



a switching network coupled to said processor controlled interface circuit, said common control circuit also including second means for transmitting said processed control data to said interface circuit on said second time division multiplex links, whereby said common control circuit is adapted to control said terminal circuits and to exchange control data between said terminal circuits and said interface circuit.

4,641,302

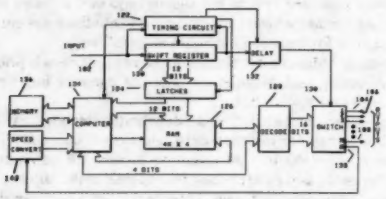
HIGH SPEED PACKET SWITCHING ARRANGEMENT

William J. Miller, North Miami, Fla., assignor to Racal Data Communications Inc., Sunrise, Fla.

Filed Jun. 24, 1985, Ser. No. 748,255

Int. Cl.[4] H04J *6/00*

U.S. Cl. 370—60 **9 Claims**



1. A circuit arrangement for routing incoming serial data to one of a plurality of outgoing ports, wherein said incoming serial data includes a header containing an N bit address which can be associated with one of said plurality of M outgoing ports to which said data should be routed, said circuit arrangement comprising:

a shift register having N stages and an input for receiving said serial data and an output for providing shifted data;

memory means having a parallel address word input coupled to each of said N stages to receive said N bit address and a parallel memory output;

said memory means being addressable so that when said N bit address is applied to said address word input, one of a plurality of unique output words appears at said parallel memory output, said output word being an unique identifier for one of said M outgoing ports to be selected for transmission of said shifted data; and

switching means receiving said shifted output and responsive to said parallel memory output for selecting one of said M outgoing ports for transmission of said shifted data.

4,641,303

METHOD AND CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF DATA SIGNAL BITS OCCURRING WITH A FIRST BIT RATE IN A BIT STREAM HAVING A SECOND BIT RATE WHICH IS HIGHER THAN THE FIRST BIT RATE

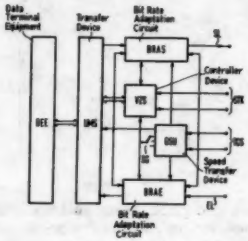
Herbert Vogl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,810

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411881

Int. Cl.[4] H04J *3/22*; H04B *1/66*

U.S. Cl. 370—84 **11 Claims**



1. A method for the transmission of data signal bits occurring with a first bit rate from a transmission device via a transmission link to a receiving device in a bit stream having a second bit rate which is higher in comparison to the first bit rate, comprising the steps of:

combining the data signal bits to be transmitted with additional filler bits to form envelopes respectively encompassing a prescribed plurality of bits when a prescribed bit rate difference between the first bit rate and the second bit rate is not transgressed, and identifying the envelopes as data signal envelopes by their filler bits belonging to a first group;

transmitting the data signal envelopes over the transmission link at the second bit rate;

given transgression of the prescribed bit rate difference between the first bit rate and the second bit rate, combining the bits of first bit groups identifying the signal bits as belonging to data signal envelopes with bits from separate envelopes which respectively contain second bit groups identifying them as blank envelopes; and

transmitting the blank envelopes over the transmission link at the second bit rate.

4,641,304

ANNOUNCED RETRANSMISSION RANDOM ACCESS SYSTEM

Dipankar Raychaudhuri, Kendall Park, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 610,007, May 14, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 873,446

Int. Cl.[4] H04J *3/02, 3/24, 3/16*

U.S. Cl. 370—95 **7 Claims**

1. A contention system for transmitting information among a plurality of transmitter-receivers along a transmission path having a delay which is long compared with the duration of an information message, so that the transmitter-receivers cannot directly establish the current status of the transmission path, the system comprising:

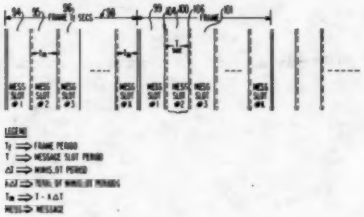
means for establishing a uniform time frame among said transmitter-receivers, said time frame including recurrent frame intervals, each frame interval including a predetermined plurality of sequential information message intervals, each information message interval including a minislot interval preceding an information transmission inter-

val, each minislot interval including a plurality of sequential minislots equal to said predetermined plurality;

random initial transmission time selection means associated with each of said transmitter-receivers for accepting during a current frame interval information to be transmitted and for randomly selecting as a selected information message interval during which transmission will occur one of said information message intervals from among available ones of said predetermined plurality of information message intervals in the selected frame interval next following said current frame interval;

random retransmission time selection means associated with each of said transmitter-receivers for randomly selecting as a retransmission information message interval one of said information message intervals from among said predetermined plurality of information message intervals in a retransmission frame interval following said selected frame interval by at least said delay;

announcing and transmission means associated with each of said transmitter-receivers for transmitting an announcement message during the minislot interval of said selected information message interval, and within said minislot



interval of said selected information message interval, within that minislot corresponding in minislot sequence within said minislot interval to the sequential position of said one of said retransmission information message intervals within said retransmission frame interval, thereby announcing to all receivers that particular information transmission interval during which retransmission of said information to be transmitted will occur in the event that a collision occurs in said selected information message interval within said selected frame interval;

collision identifying means associated with each of said transmitter-receivers for identifying collisions within said information message intervals;

identifying and inhibiting means associated with each said transmitter-receivers for identifying said available ones of said predetermined plurality of information message intervals in said selected frame interval, said identifying and inhibiting means excluding as available information message intervals those information message intervals which are both announced by any of said announcing and transmission means as being for retransmission of information in the event of a collision, and identified by said collision identifying means as being associated with a collision.

4,641,305

CONTROL STORE MEMORY READ ERROR RESILIENCY METHOD AND APPARATUS

Thomas F. Joyce, Westford, Mass., and Richard P. Kelly, Nashua, N.H., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 19, 1984, Ser. No. 663,101
Int. Cl.[4] G06F *11/10, 11/14*
U.S. Cl. 371—12 **14 Claims**

7. A microprogrammed control system comprising:

A. a control store for storing a plurality of microinstructions;

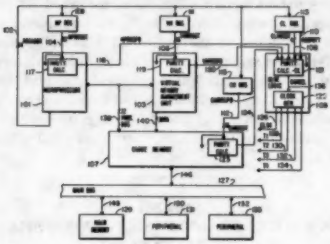
B. means for reading a current microinstruction of said plurality of microinstructions from said control store;

C. means for executing said current microinstruction;

D. means for detecting if said current microinstruction was read without an error from said control store;

E. means for generating, while executing said current microinstruction and detecting if said current microinstruction was read without an error, a next address of a next microinstruction to be read from said control store;

F. means for inhibiting said means for executing from mak-



ing any change in the state of said microprogrammed control system that would prohibit said current microinstruction from being re-executed before said means for detecting a read error has determined that said current microinstruction was read without error; and

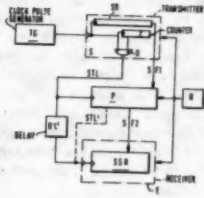
G. means for aborting the execution of said current microinstruction by said means for executing if said means for detecting determines that said current microinstruction was read with an error.

4,641,306

CIRCUIT ARRANGEMENT FOR TESTING A DIGITAL CIRCUIT

Karl-Heinz Annecke, Backnang, and Volker Bredemeier-Klonki, Oppenweiler, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,066
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325247
Int. Cl.[4] G06F *3/04*
U.S. Cl. 371—25 **9 Claims**



1. Circuit arrangement for dynamic real time testing of a synchronous digital circuit having a clock pulse input, a stimulus input and a circuit node, wherein a digital test signal is produced at the circuit node of the digital circuit after a time delay, caused by the digital circuit, of τ seconds relative to the time of receipt of a signal at the stimulus input of the digital circuit, said arrangement comprising:

clock pulse generator means for generating clock pulses;

transmitter means connected to said clock pulse generator means and including a counter for counting the clock pulses and a digital signal generator means for generating a reproducible digital stimulus signal having a length corresponding to a predetermined count of said counter, said transmitter means having a clock pulse output and being connected for coupling a number of clock pulses corresponding to the predetermined count of said counter

to the clock pulse input of the digital circuit and for delivering the digital stimulus signal to the stimulus input of the digital circuit in synchronism with the clock pulses coupled to the clock pulse input;

delay means having an input and an output, the input of said delay means being connected to the clock pulse output of said transmitter for delaying the clock pulses by a time delay corresponding to the τ second time delay of the digital test signal caused by the digital circuit; and

analyzing means having a first input arranged for receiving the digital test signal from the digital circuit and a second input connected to the output of said delay means for receiving the same number of clock pulses, delayed by τ seconds, coupled to the digital circuit, said analyzing means including feedback shift register means for compressing the test signal into a test signature which can be checked for errors by comparison with a desired signature.

4,641,307

DATA PACKET TRANSMISSION USING SHARED CHANNEL

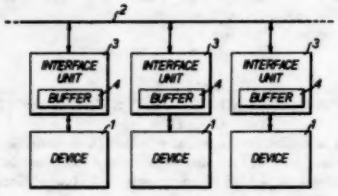
Brian M. Russell, Oldham, Great Britain, assignor to International Computers Limited, London, England

Filed Feb. 21, 1984, Ser. No. 582,183

Claims priority, application United Kingdom, Feb. 22, 1983, 8304950

Int. Cl.[4] H04Q *11/04*; H04J *3/02*

U.S. Cl. 370—60 **15 Claims**



1. A method of transmitting data from a source device to a predetermined destination device in a system comprising a plurality of devices, a plurality of interface means, and a common communications channel, each device being coupled to the channel through an associated one of the said interface means, only one of the interface means at a time being permitted to transmit a packet over the channel, the method comprising transferring the data from the source device to its interface means in individual data units with no indication of how the data units are to be grouped into packets, storing the units in storage means in that interface means, and, when the interface means is permitted to transmit a packet, transmitting a packet comprising all the data units stored in the said storage means and not previously transmitted.

4,641,308

METHOD OF INTERNAL SELF-TEST OF MICROPROCESSOR USING MICROCODE

Stephen P. Sacarisen, and Otto N. Fanini, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1984, Ser. No. 567,598

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **8 Claims**

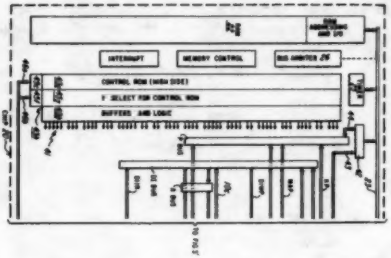
1. A method of testing a processor device; said device formed at a face of a semiconductor body and having a standard mode of operation and an internal test mode of operation, the device containing:

(a) a control ROM at said face, said control ROM having addressing means with an input, the control ROM producing a plurality of sets of control signals at outputs thereof, each set corresponding to a given address at said input;

(b) a plurality of registers for holding data, each register having a plurality of stages, each stage having at least one input and at least one output and having separate control means for each such input and output;

(c) a plurality of busses, each bus including a set of separate conductive lines, each of said stages of the plurality of registers having at least one of said conductive lines connected to the input or output thereof via said control means;

(d) a plurality of control lines from the control ROM extending along said face, each of said control means in each of said stages of said registers being connected to a different one of said control lines;



(e) said control ROM including an array of cells for storing said plurality of sets of control signals for coupling to said control lines, the cells storing a first plurality of sequences of said sets of control signals to define said standard mode of operation, and for also storing a second plurality of sequences of said sets of control signals to define said test mode of operation;

(f) a plurality of terminals on said device, including a plurality of operating terminals and also test terminals,

(g) said method comprising the steps of applying a first control code to test terminals of said processor device to cause said addressing means of the control ROM to address only said first plurality of sequences; or alternatively applying a second control code to said test terminals to cause said addressing means to address only said second plurality of sequences.

4,641,309

METHOD AND APPARATUS FOR SELECTIVELY COMPENSATING BURST ERRORS OF VARIABLE LENGTH IN SUCCESSIVE DIGITAL DATA WORDS

Kenji Nakano, Ebina, and Hisayoshi Moriwaki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 447,119, Dec. 6, 1982, abandoned. This application Jul. 1, 1985, Ser. No. 750,243

Claims priority, application Japan, Dec. 8, 1981, 56-197437

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—31 **40 Claims**

1. A method of selective and digitally compensating burst errors of variable length in successive data words; comprising the steps of:

receiving said successive data words;

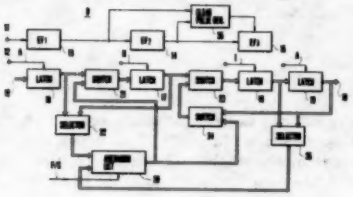
identifying those data words which are erroneous and those data words which are correct;

sensing the presence of one of the following error condi-

tions: (a) an erroneous data word preceded and followed, respectively, by correct data words; (b) two successive erroneous data words preceded and followed, respectively, by correct data words; and (c) at least three successive erroneous data words preceded by a correct data word; and

compensating the respectively sensed error condition as follows:

in condition (a), replacing the erroneous data word with a compensated data word which is an average of the correct



preceding and following data words; in condition (b), replacing the erroneous data words with respective compensated data words derived by a process including averaging said correct preceding and following data words to produce a pseudo data word, and average said pseudo data word with one of said correct preceding and following data words to produce a compensated data word for replacing one of said erroneous data words and in condition (c), replacing at least the first of said successive erroneous data words with the preceding correct data word.

4,641,310

DATA PROCESSING SYSTEM IN WHICH UNRELIABLE WORDS IN THE MEMORY ARE REPLACED BY AN UNRELIABILITY INDICATOR

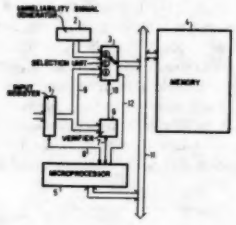
Theodorus G. J. A. Martens; Frits A. Steenhof, and Johannes J. W. Kalfs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,710

Claims priority, application Netherlands, Nov. 2, 1983, 8303765

Int. Cl.[4] G06F *11/10*; G11C *29/00*

U.S. Cl. 371—38 **9 Claims**



1. In a data processing system comprising

data input means connected to receive blocks of data, wherein each data block contains at least one data word and check bits,

a data verifier,

means connecting said data input means to an input of the verifier, the verifier comprising means responsive to the check bits of a received data block for verifying whether the data block contains reliable data, and for generating an unreliability signal when the received data word does not contain reliable data,

a memory, and

means coupling said data input means to said memory for the storage of data words therein;

the improvement wherein the means coupling the data input means to the memory comprises a selection unit, and further comprising a generator for generating an unreliability indicator,

said selection unit having a first input connected to the data input means, a second input connected to receive the unreliability indicator from the generator, and an output coupled to said memory,

said selection unit comprising means responsive to said unreliability indicator for blocking said first input from said memory and for substituting an unreliability indicator at said second input for the data word portion of a data block that contains unreliable data,

whereby data words stored in said memory and corresponding to unreliable data words received at said first input means are comprised of said unreliability indicator.

4,641,311

PHASE-LOCKED SEMICONDUCTOR LASER ARRAY WITH INTEGRAL PHASE SHIFTERS

Donald E. Ackley, West Amwell Township, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1983, Ser. No. 563,605

Int. Cl.[4] H01S *3/098*

U.S. Cl. 372—18 **9 Claims**

1. A phase-locked semiconductor laser array comprising

a body of semiconductor material having first and second reflecting surfaces with at least said first reflecting surface being partially transparent at the laser wavelength so that light may be emitted therefrom; said body including:

a substrate with a pair of opposed major surfaces with a plurality of substantially parallel channels with lands therebetween in the first major surface and extending between the reflecting surfaces;

a first cladding layer overlying the first major surface of the substrate and the channels;

a laser cavity region overlying the first cladding layer;

a second cladding layer overlying the laser cavity region; and

first and second electrical contacts to the second cladding layer and the second major surface of the substrate respectively;

wherein each channel is spaced from adjacent channels by a distance such that the laser oscillations over adjacent channels are phase-locked to one another; and

alternate channels having means for shifting the phase of laser beams propagating in the cavity region over said alternate channels relative to the phase of laser beams propagating over the adjacent channels.

4,641,312
METHOD AND DEVICE FOR PRODUCING INDIVIDUAL SHORT LASER PULSES

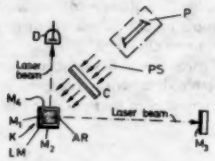
Fritz P. Schäfer, Göttingen-Nikolausberg; Sandor Szatmari, Göttingen, and Zsolt Bor, Göttingen-Nikolausberg, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,320

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317065; Sep. 16, 1983, 3333575

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—25 **19 Claims**



1. In a method of producing an individual laser radiation pulse of predetermined short duration utilizing a single stimulatable laser medium commcn to a first resonator and a second resonator, said first resonator having a low quality factor, a short time constant, and a high laser threshold value, said second resonator having a high quality factor relative to said low quality factor, a long time constant relative to said short time constant and a low laser threshold value relative to said high laser threshold value, the laser medium being excited by a pump pulse having a duration much longer than said short pulse duration and an amplitude sufficient to produce a population inversion in the laser medium exceeding said high laser threshold value, and in which the population inversion is reduced below said high threshold value after emission of a short duration radiation pulse, the improvement comprising the following steps:

A. generating said short duration laser pulse by a relaxation process in the first resonator, said relaxation process tending to produce a series of spaced short duration laser radiation pulses, of which the individual short duration laser pulse is the first; and

B. after production of said individual short duration laser pulse and before any subsequent relaxation pulse in said series can build up in said first resonator, maintaining the population inversion in said laser medium below said high threshold value in said first resonator by a steady build-up of laser oscillations in said second resonator, said oscillations in said second resonator continuously withdrawing sufficient energy from said laser medium to keep the population inversion therein below said high threshold value in said first resonator until termination of said pump pulse.

4,641,313
ROOM TEMPERATURE METAL VAPOUR LASER

Roderick C. Tobin, Mount Waverley, and Nigel D. Perry, Altona, both of Australia, assignors to Monash University, Clayton, Australia

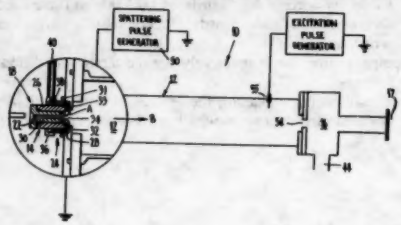
Filed Aug. 28, 1984, Ser. No. 644,955

Claims priority, application Australia, Jun. 15, 1984, PG5528

Int. Cl.[4] H01S *3/22*

U.S. Cl. 372—56 **4 Claims**

1. A room temperature metal vapour laser having an optical cavity, a sputtering cathode and an anode located at one end of said cavity, said sputtering cathode having a sputtering surface exposed to the optical cavity, power supply means for producing a first electrical discharge between the sputtering cathode and the anode to vapourize a metal from the sputtering surface, a gaseous jet means for introducing an inert gas stream into the optical cavity and in flowing contact with said sputtering surface to entrain metal vapour from said sputtering surface into a collimated beam in the optical cavity, a second electrical discharge means having an electrode adjacent to said collimated beam in the optical cavity separate and remote from the



sputtering cathode surface and said anode for exciting the metal vapour entrained in said inert gas stream such that said discharge is drawn into the collimated metal vapour beam in preference to atmosphere surrounding the beam.

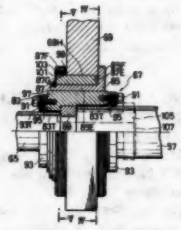
4,641,314
LASER TUBE HOLDER IN A LASER OSCILLATOR

Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., La Miranda, Calif.

Filed Jan. 6, 1986, Ser. No. 816,252

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—65 **7 Claims**



1. A laser oscillator laser tube holder for a laser tube used in a laser oscillator in which a laser oscillator support plate supports a cylindrical joint holder which supports a connecting section of said laser tube in said laser oscillator, comprising: an inner eccentric holder for rotatably supporting said joint holder in a fitting relationship, an eccentric cylindrical section formed in said inner eccentric holder, an outer eccentric holder for rotatably supporting said eccentric cylindrical section of said inner eccentric holder in a fitting relationship, and an eccentric cylindrical section formed in said outer cylindrical holder and rotatably mated with and supported by the laser oscillator support plate.

4,641,315
MODIFIED INVOLUTE FLASHLAMP REFLECTOR

Vaughn G. Draggoo, Livermore, Calif., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1984, Ser. No. 684,251

Int. Cl.[4] H01S *3/093*

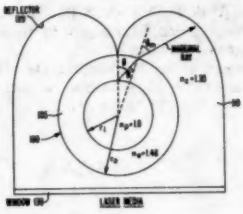
U.S. Cl. 372—72 **4 Claims**

1. A reflector for a laser having a substantially cylindrical flashlamp whose marginal angle, ϕ_m, is less than 90°, said laser reflector comprising a surface of light-reflective material and a cross-section, in a plane perpendicular to the axis of said cylindrical lamp, defined by

$$x=\pm(r\cos\theta+r\theta\sin\phi_m(\cos\phi_m\cos\theta-\sin\phi_m\sin\theta)),$$

and

$$y=r\sin\theta+r\theta\sin\phi_m(\cos\phi_m\sin\theta-\sin\phi_m\cos\theta),$$



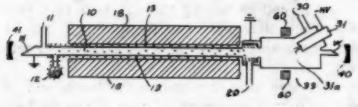
where x and y are orthogonal axes of a Cartesian coordinate system which axes intersect at the axis of said flashlamp, where θ represents a varying angle of rotation around said flashlamp axis such that $0\leqq\theta<\pi$, and where r is the radius of said cylindrical flashlamp.

4,641,316

D.C. ELECTRON BEAM METHOD AND APPARATUS FOR CONTINUOUS LASER EXCITATION

George J. Collins; Jorge J. Rocca, and Jack D. Meyer, all of Ft. Collins, Colo., assignors to Applied Electron Corp., Albuquerque, N. Mex.

Continuation of Ser. No. 353,428, Mar. 1, 1982, abandoned. This application Oct. 1, 1984, Ser. No. 656,408
Int. Cl.⁴ H01S *3/09*
U.S. Cl. 372—74 **12 Claims**



1. A laser comprising, in combination:

a single enclosure having an optical axis that is defined by a resonant cavity comprising two mirrors, one at each end thereof, one or both of which is employed to extract power from the laser, the single enclosure being filled with a suitable gas laser medium and being electrically connected to a source of ground potential;

a glow discharge electron gun contained within said single enclosure and having a solid wall cathode, said solid wall cathode having one or more faces emitting beam electrons, said one or more faces emitting beam electrons being constructed of a high secondary electron emission coefficient material for producing a large number of secondary electrons per incident bombarding ion, said glow discharge electron gun being coupled to receive a source of operating voltage sufficient to cause emission of beam electrons therefrom and being physically positioned to inject those beam electrons into the gas laser medium within the single enclosure, thereby exciting the gas laser medium to become a plasma volume for employment as a laser active medium; and

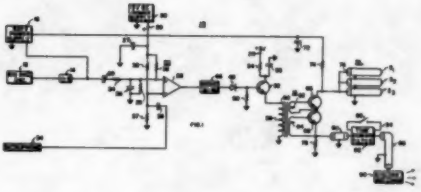
means for producing a magnetic field for confining said beam electrons.

4,641,317

SPREAD SPECTRUM RADIO TRANSMISSION SYSTEM

Larry W. Fullerton, Huntsville, Ala., assignor to Charles A. Phillips, Ardmore, Tenn., a part interest

Filed Dec. 3, 1984, Ser. No. 677,597
Int. Cl.⁴ H04B *15/00*; H04K *1/00*; H04L *27/30*
U.S. Cl. 375—1 **12 Claims**



1. A spread spectrum radio transmission system comprising:

a radio transmitter comprising:

pulse generating means for generating reoccurring pulses, said pulses appearing at a selected time spacing,

a source of intelligence signals, and

modulation means responsive to said pulses generating means and said source of intelligence signals for providing as an output a train of pulses wherein the leading edge of pulses is varied in time position as a function of intelligence signal;

avalanche semiconductor switching means, having a control signal input responsive to said output of said modulation means, a bias power input, and a switched power output, for switching power on and off to said switched power output;

a D.C. bias source coupled to said bias power input comprising a delay line having a delay of 1 picosecond to 50 nanoseconds and delay line charging means coupled to said delay line for charging said delay line between pulses of said train of pulses;

transmitting antenna means comprising an aresonant antenna coupled to said switched power output and to space for transmitting a signal received from said switched power output; and

a radio receiver comprising:

receiving antenna means comprising an aresonant antenna for receiving transmissions from said transmitting antenna means and for providing as an output electrical pulses responsive to the transmitted pulse signals,

amplification means responsive to the output of said receiving antenna means for amplifying received pulses,

synchronous detection means, including signal sensitive windowing means having a signal input responsive to the ouput of said amplification means, for responding to, and providing an output for, signals appearing within reoccurring windows of time generally coincident with the average time of occurrence of pulses received by said receiving means and including means for being insensitive to received signals appearing between the occurrence of said windows of time,

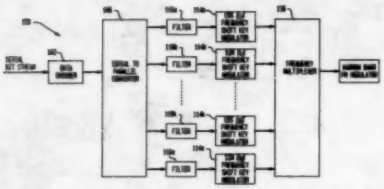
signal conversion means for converting the output of said detection means into a replica of signals of said intelligence signals, and

signal reproduction means responsive to the output of said signal conversion means for reproducing said intelligence signals.

4,641,318
METHOD FOR IMPROVING THE RELIABILITY OF DATA TRANSMISSION OVER RAYLEIGH FADING CHANNELS

Eric J. Addeo, Washington Township, Morris County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 25, 1985, Ser. No. 727,241
Int. Cl.[4] H04L 1/02
U.S. Cl. 375—38 15 Claims



12. An apparatus for transmitting a relatively high bit rate stream of data over a Rayleigh fading channel,

said apparatus comprising

(a) means for converting said relatively high bit rate stream of data into N parallel relatively low bit rate streams of data;

(b) a plurality of subcarrier modulating means for modulating each of N separate subcarriers in accordance with the content of a respective bit of said N parallel streams of data for a duration longer than that of the Rayleigh channel fade;

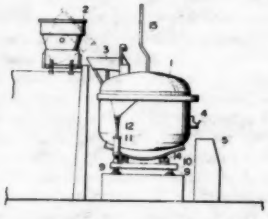
(c) summing means for summing said N modulated subcarriers for form a composite signal; and

(d) carrier modulating means for modulating said composite signal onto a carrier having the frequency of said Rayleigh fading channel.

4,641,319
METHOD FOR QUANTITATIVE DISCHARGE OF MOLTEN MATERIAL

Takaatsu Nagai, Tokyo; Masayuki Takada, Nagano; Akira Sato, and Mineo Imamura, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,576
Claims priority, application Japan, Mar. 31, 1983, 58-53904
Int. Cl.[4] F27D 3/00
U.S. Cl. 373—84 19 Claims

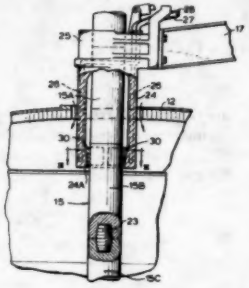


1. In a method for intermittently charging a molten principal raw material and any supplementary material as needed to provide a specified raw material formulation into a melting furnace and continuously discharging a molten material therefrom, the method for quantitative discharge of the molten material comprising determining the weight of the tiltable melting furnace, said weight changing with the discharging of the molten material, computing the rate of change in weight of the molten material with respect to time from the determined weights of said furnace, and tilting said furnace to a position indicated by comparison of said computed rate of change in weight of the molten material with respect to time and the set rate of change in weight of the molten material with respect to time.

4,641,320
SHROUD FOR FURNACE ELECTRODE

Michael J. Mullen, Sterling, Ill., assignor to Northwestern Steel and Wire Company, Sterling, Ill.

Continuation-in-part of Ser. No. 450,242, Dec. 16, 1982. This application Dec. 18, 1984, Ser. No. 682,937
Int. Cl.[4] H05B 7/102
U.S. Cl. 373—96 4 Claims



1. An electric arc furnace assembly comprising:

a furnace body,

a roof removably secured to said furnace body,

a plurality of electrode holders positioned above said roof,

an electrode adjustably positionable in each holder for controlled insertion into said furnace, each electrode being supported in depending relation with said furnace body solely by the support from its associated holder,

a shroud secured to each of said electrode holders and having a lower end extending through said roof into said furnace, each electrode extending through one of said shrouds, each shroud having an internally tapered wall therein,

a conductive split ring disposed in the lower end of said shroud, said ring consisting of ring segments having a taper corresponding to the taper of said tapered wall and being free to ride up the inner wall of said shroud when lateral displacement of the electrode extending therethrough occurs, the radial spacing between the lower end of said ring and said electrode being sufficiently small to provide substantial flow resistance to corrosive furnace gases tending to pass between said electrode and said ring, said shroud having sufficient axial length to provide a lateral abutment surface for said electrode when said electrode is displaced from its vertical position, thereby reducing the bending moment tending to break said electrode upon such displacement.

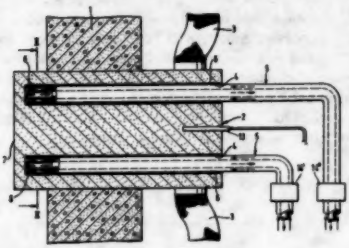
4,641,321
COOLED FURNACE HEAD FOR HEAVY-CURRENT RESISTANCE FURNACES

Jürgen Semmler, Donauwörth, Fed. Rep. of Germany, assignor to Sigri GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,630
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427407
Int. Cl.[4] H05B 3/00, 3/60
U.S. Cl. 373—120 11 Claims

1. Furnace head for heavy-current resistance furnaces of

refractory masonry, at least one electrode inserted into the masonry, at least one cooling device inserted in the electrode and extending almost the full length of the electrode but stopping short of the end thereof, and means for controlling cooling of the electrode to obtain an electrode temperature which is about the same temperature as the masonry.

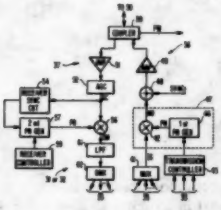


4,641,322

SYSTEM FOR CARRYING OUT SPREAD SPECTRUM COMMUNICATION THROUGH AN ELECTRIC POWER LINE

Satoshi Hasegawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 662,111
Claims priority, application Japan, Oct. 18, 1983, 58-194908; Feb. 2, 1984, 59-17353; Jul. 3, 1984, 59-137609
Int. Cl.[4] H04B *3/54*
U.S. Cl. 375—1 **14 Claims**



1. A system for use in conveying a tranmission signal from a transmission station to a reception station through an electric power line for electric power of a commercial frequency falling within a first frequency range, said electric power line having a variable loss,

said transmission station comprising:

modulation means responsive to said transmission signal for carrying out spread spectrum modulation of said transmission signal by the use of a first pseudorandom code to produce a modulated signal which is subject to said spread spectrum modulation and which is dispersed in a second frequency range different from said first frequency range;

sychronization signal producing means for producing a sychronization signal; and

combining means coupled to said electric power line, said modulating means, and said synchronization signal producing means for combining said modulated signal and said synchronization signal into a combined signal to supply said electric power line with said combined signal;

said reception station comprising:

demodulating means coupled to said electric power line for demodulating said combined signal into a demodulated signal by the use of a second pseudorandom code corresponding to said first pseudorandom code, said demodulated signal comprising a reproduction of said modulated signal and a synchronization component representing said synchronization signal, and having a variable level resulting from said variable loss of the electric power line;

clock pulse generating means coupled to said demodulating means for generating a sequence of clock pulses in response to said synchronization component and said variable power level; and

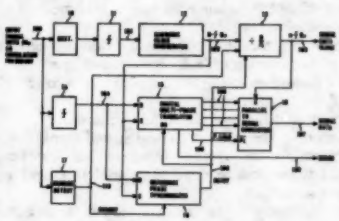
means coupled to said clock pulse generating means and said demodulating means for supplying said demodulating means with said second pseudorandom code which is synchronized with said clock pulse sequence.

4,641,323

MULTI-PHASE PSK DEMODULATOR

Chung K. Tsang, 175 Bethany Leigh Dr., Scarborough, Ontario M1V 2T6, Canada

Filed Feb. 7, 1983, Ser. No. 464,636
Int. Cl.[4] H04L *27/16*
U.S. Cl. 375—80 **12 Claims**



1. A multi-phase PSK (phase shift key) demodulator for operating upon an input signal representing a continuous N-th phase ($N=2^n$, n being a natural number) PSK modulated source with a predetermined sync preamble and outputting a binary encoded serial data independent of data pattern when said input signal being preemphasized or conditioned, said demodulator comprising:

(a) a full wave rectifier means slicing the input signal into an uni-polar signal,

(b) a first hard limiter means converting the uni-polar signal into a rectangular clock tracking signal source,

(c) a harmonic clock regenerator means receiving said rectangular clock tracking signal source for reproducing a N-th time harmonic frequency source of the carrier independent of signal's data pattern and feeding said harmonic frequency source to a multi-phase translator and reference phase synchronizer,

(d) a second hard limiter means converting the input signal into a N-th phase rectangular wave PSK signal,

(e) said digital multi-phase translator means responding to clock output of the harmonic clock regenerator and rectangular PSK signal output of second hard limiter for producing a binary parallel data,

(f) a frequency divider means dividing said N-th time harmonic frequency source into a serial data clock,

(g) a parallel to serial converter means converting said parallel data into a serial one with the application of data clock,

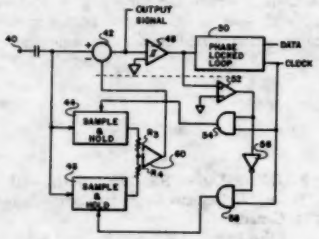
(h) a carrier detect means generating a one-shot signal during the preamble period to control the frequency divider and enable a reference phase synchronizer, and,

(i) said reference phase synchronizer means extracting the reference phase signal from the preamble sync pattern to synchronize said digital multi-phase translator and frequency divider.

4,641,324
SIGNAL CORRECTION APPARATUS

Herbert Karsh, Laguna Beach, and Ward M. Calaway, Sierra Madre, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,596
Int. Cl.[4] H04L 25/06
U.S. Cl. 375—76 14 Claims



4. A method for recovering a baseline corrected self clocking NRZ digital waveform from a self clocking NRZ digital waveform subject to baseline variation, said method comprising the steps of:

(a) recovering the clocking signal from said baseline corrected self clocking NRZ digital waveform,

(b) periodically sampling the amplitude of said self clocking NRZ digital waveform,

(c) storing said sampled amplitude values,

(d) computing the average of said stored amplitude values,

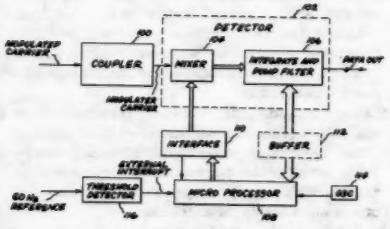
(e) subtracting said average from said self clocking NRZ digital waveform to provide a baseline corrected NRZ digital waveform,

said sampling being synchronously locked for occurrence at the nominal times of occurrence of said NRZ digital waveform peaks, and said synchronous locking being synchronized to said baseline corrected NRZ digital waveform.

4,641,325
RECEIVER FOR PHASE SHIFT MODULATED CARRIER SIGNALS

William C. Hughes, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1985, Ser. No. 697,994
Int. Cl.[4] H04L 27/06
U.S. Cl. 375—97 9 Claims



1. Apparatus for providing a local oscillator signal with a frequency which is at all times equal to a constant multiple of the frequency of a reference waveform, comprising:

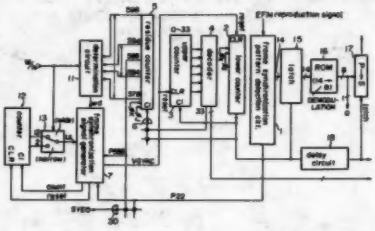
means, responsive to said reference waveform, for providing an interrupt signal upon the occurrence of a predetermined point in each cycle of said reference; and

digital processing means for providing said local oscillator signal, said digital processing means being responsive to said interrupt signal for determining the number of pulses of said local oscillator signal provided during one cycle of said reference waveform and for modulating the frequency of said local oscillator such that the number of local oscillator pulses provided during one cycle of said reference waveform is maintained to substantially equal said constant, said digital processing means comprising a microprocessor adapted to provide said local oscillator signal, and responsive to said interrupt signal for determining the number of local oscillator pulses provided during one cycle of said reference and for modulating the number of local oscillator pulses provided to maintain this number to substantially equal said constant.

4,641,326
COUNTER CIRCUIT OPERABLE IN SYNCHRONISM WITH FRAME OR DIGITAL DATA SIGNAL

Norio Tomisawa, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 10, 1984, Ser. No. 659,576
Claims priority, application Japan, Oct. 14, 1983, 58-190911
Int. Cl.[4] H04L 7/00
U.S. Cl. 375—108 7 Claims



1. A counter circuit operable in synchronism with a frame of a digital data signal in a digital audio system, the frame being composed of a predetermined number of channel bits, said counter circuit comprising:

(a) frame synchronization detecting means for detecting a frame synchronization signal contained in the digital data signal to produce a frame synchronization detection signal;

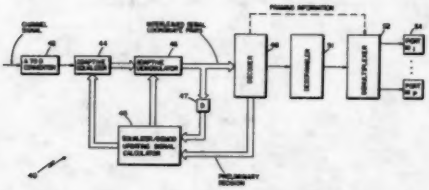
(b) counter means for counting reproduction clock pulses reproduced from the digital data signal to produce a count signal when the count of said counter means reaches a value corresponding to the predetermined number of channel bits, wherein each reproduction clock pulse corresponds to a channel bit of the frame; and

(c) signal feeding means for feeding a reproduction frame synchronization signal to said counter means for resetting the counter means, said signal feeding means being responsive to said frame synchronization detection signal to output said detection signal as said reproduction frame synchronization signal when the detection signal occurs within a predetermined range of the count of the counter means, and said signal feeding means being responsive to said count signal to output said count signal as said reproduction frame synchronization signal when said frame synchronization detection signal is not outputted from said frame synchronization signal detecting means within said predetermined range.

4,641,327
FRAME SYNCHRONIZATION IN TRELLIS-CODED COMMUNICATION SYSTEMS

Lee-Fang Wei, Westwood, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Jul. 9, 1985, Ser. No. 753,182
Int. Cl.[4] H04L 7/04; G06F 11/10
U.S. Cl. 375—114 13 Claims



1. Apparatus for maintaining frame synchronization in a communication system comprising

a transmitter that sends a sequence of signal points in successive time intervals, said signal points being drawn from a constellation of available signal points such that said sequence is one of a set of permissible sequences that is smaller than the set of all possible sequences of said signal points, said sequence of signal points being organized as a series of frames, each frame beginning at a predetermined time, and

a receiver that determines said predetermined time when each said frame begins in order to maintain frame synchronization with said transmitter, said receiver comprising

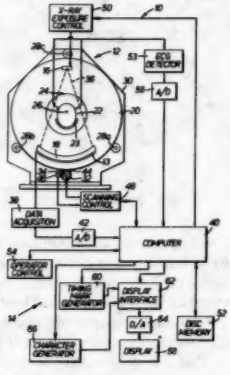
a decision device for determining said sequence of signal points which were sent by determining the minimum next path metric based on current path metrics and current branch metrics, and

means for detecting and monitoring the rate of occurrence of non-zero difference between said minimum next path metric and the minimum of said current branch metrics as an indication of loss of frame synchronization.

4,641,328
COMPUTED TOMOGRAPHY APPARATUS

Masakuni Fujise, Nishinasuno, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 21, 1983, Ser. No. 515,904
Claims priority, application Japan, Jul. 21, 1982, 57-125906
Int. Cl.[4] H05G 1/10, 1/64; A61B 6/00
U.S. Cl. 378—8 5 Claims



1. A computed tomography apparatus for reconstructing cross-sectional images of a body to be examined corresponding to selected cardiac phases of the cardiac cycle, comprising:

means for directing a divergent beam of penetrating radiation through the body;

means for effecting relative angular displacement between the divergent beam of penetrating radiation and the body irrespective of the cardiac cycle of the body;

means for detecting the penetrating radiation that passes through the body at a number of angular positions of the divergent beam relative to the body during said relative angular displacement to derive sets of detected radiation measurements representative of attenuation of the penetrating radiation by the body;

display means including a cathode ray tube having a display screen;

ECG detector means for generating electrocardiogram signals, during said relative angular displacement, corresponding to electrical signals of the heart created during each cardiac cycle;

means for storing the radiation measurements detected by said detecting means, together with data corresponding to the electrocardiogram signals generated from said ECG detector means said electrocardiogram data being associated with said radiation measurements when such data is acquired in that said radiation measurements are correlated with the various cardiac phases of the cardiac cycles represented in such data;

sequence control means for selecting specific phases of the cardiac cycle during which cross-sectional images of the examined body will be reconstructed and displayed;

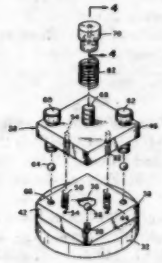
means for reconstructing the cross-sectional images of the body corresponding to the selected cardiac phases and said detected radiation measurements associated therewith and including display interface means for providing video signals corresponding to said cross-sectional images on said display screen of the cathode ray tube; and

means for providing on said display screen an electrocardiogram display corresponding to the stored electrocardiogram data in said storing means upon the selection of a specific cardiac phase by said sequence control means.

4,641,329
FIXTURE FOR SUPPORTING AND ALIGNING A SAMPLE TO BE ANALYZED IN AN X-RAY DIFFRACTION APPARATUS

Lanny A. Green, and Joaquim L. Heck, Jr., both of Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 23, 1985, Ser. No. 726,562
Int. Cl.[4] G01N 23/20
U.S. Cl. 378—79 7 Claims



1. A fixture for aligning and supporting a sample in a X-ray beam projecting from an X-ray source to an X-ray detector mounted for rotation about a first axis for X-ray diffraction analysis of the sample, comprising base means rotatable on said first axis and supported at a location intermediate said X-ray

beam source and said X-ray detector, first and second plate means carried by and rotatable with said base means and disposed on said base means in a stacked array along said first axis and with juxtaposed planar surfaces disposed perpendicular to said first axis, yieldable means securing the first plate means to the second plate means for urging the first plate means towards the second plate means, boss means centrally disposed on a surface of said first plate means and extending along said first axis, sample supporting means movably attached to said boss means for selective movement along said first axis and having an elongated receptable therein extending along said first axis for receiving and supporting a sample-containing capillary on said first axis, and selectively adjustable spacer means for tilting said first plate means and the sample supporting means along at least one other axis for positioning and maintaining the sample-containing capillary on said first axis during rotation of said base means.

4,641,330

HIGH VOLTAGE SUPPLY CIRCUIT FOR AN X-RAY TUBE

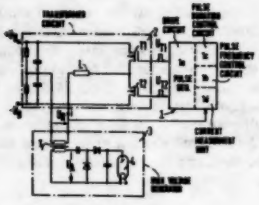
Thomas Herwig, Eltville, and Georg Gens, Wiesbaden, both of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Aug. 7, 1985, Ser. No. 763,425

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431082

Int. Cl.[4] H05G 1/32, 1/20

U.S. Cl. 378—101 5 Claims



1. In a high voltage supply circuit for an x-ray tube having a pulse generator and a high voltage generator including a high voltage transformer, the improvement comprising:

a drive circuit for said supply circuit including said pulse generator and having means connected to said pulse generator for controlling the pulse frequency of pulses generated by said pulse generator and means connected to said pulse generator for independently controlling the pulse duration of pulses generated by said pulse generator, said means for controlling the pulse frequency initially selecting a pulse frequency for said pulse generator and said means for controlling said pulse duration thereafter regulating the amplitude of the voltage at said high voltage transformer by controlling only said pulse duration.

4,641,331

AUTOMATIC EXPOSURE DEVICE FOR A PANORAMIC X-RAY PHOTOGRAPHING DEVICE

Takao Makino, Otsu, and Shinichi Osada, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

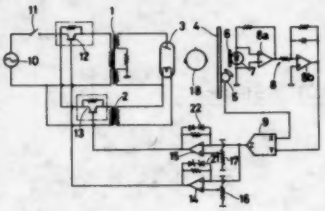
Filed Aug. 1, 1984, Ser. No. 636,689

Claims priority, application Japan, Aug. 2, 1983, 58-142045

Int. Cl.[4] H05G 1/30, 1/32

U.S. Cl. 378—108 6 Claims

1. An automatic exposure device for a panoramic X-ray photographing apparatus comprising a means for converting a residual X-ray dose penetrating a patient and an X-ray film into an electrical output, a comparing means for comparing the level of said electrical output with a preset level, a tube voltage feedback control element provided at the primary side of a high voltage transformer, a tube current feedback control element provided at the primary side of a filament transformer, wherein both feedback control elements are simultaneously feedback-controlled by the output of said comparing means, and a means for detecting the feed speed of the X-ray film and



converting the speed into an electrical output so that said electrical output of said residual penetrated X-ray dose and the electrical output of said feed speed may be simultaneously inputted to said comparing means and that the ratio of the two outputs may be delivered as the output of said comparing means.

4,641,332

X-RAY TUBE COMPRISING ANODE DISC ROTATABLY SUPPORTED BY BEARING HAVING PUSH-PULL BEARING ON AN AXIAL FACE

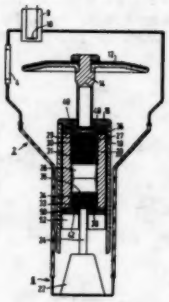
Jan Gerkema, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1984, Ser. No. 667,945

Claims priority, application Netherlands, Nov. 8, 1983, 8303832

Int. Cl.[4] H01J 35/10

U.S. Cl. 378—125 10 Claims



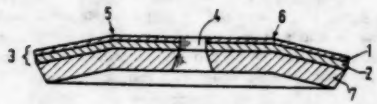
1. An X-ray tube comprising an anode disc which is rotatably supported by a bearing member comprising cylindrical and axial face components; the improvement therein comprising said bearing member having a push-pull bearing on an axial face, said axial face having a pattern of helical grooves on it, and a liquid metal lubricant cooperating with said pattern of helical grooves so that a comparatively strong negative pressure occurs on said axial face upon rotation of said bearing member.

4,641,333

METHOD OF MANUFACTURING AN X-RAY TUBE ROTARY ANODE AND AN X-RAY TUBE ROTARY ANODE MANUFACTURED ACCORDING TO THIS METHOD

Laurentius M. J. Goossens; Gerhardus A. te Raa, and Bernhard J. P. van Rhoonen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1985, Ser. No. 773,725
Claims priority, application Netherlands, Sep. 14, 1984, 8402828
Int. Cl.[4] H01J 35/10
U.S. Cl. 378—144 8 Claims



1. A method of manufacturing a laminated anode for an X-ray tube, said method comprising the steps of:

(a) bonding a target layer consisting essentially of tungsten to a support layer consisting essentially of molybdenum by using a high-speed deformation impact process; and

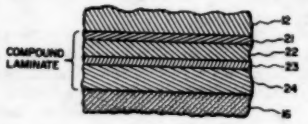
(b) increasing the thickness of the support layer to a thickness sufficient to provide a heat sink for high load operation, by using a thermal spraying process to deposit thereon a material consisting essentially of molybdenum, said thermal spraying process being performed at a temperature which is sufficiently low to prevent the temperature of the anode from exceeding 1650° C., but which is sufficiently high to ensure that the deposited material forms a strong bond and has a density which is at least 85% of the theoretical maximum.

4,641,334

COMPOSITE ROTARY ANODE FOR X-RAY TUBE AND PROCESS FOR PREPARING THE COMPOSITE

Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1985, Ser. No. 702,160
Int. Cl.[4] H01J 35/10
U.S. Cl. 378—144 14 Claims



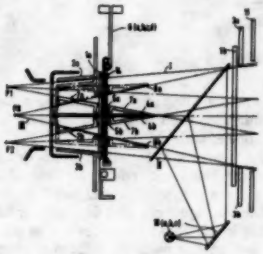
1. In an anode assembly for a rotating anode for an X-ray tube wherein a graphite body is joined to the surface of a metal component of said anode assembly, the metal of said metal component being selected from the group consisting of molybdenum, molybdenum alloys, tungsten and tungsten alloys, the improvement wherein said graphite body and the surface of said metal component are separated by a crack-free intermediate compound laminate; said compound laminate consisting of, in sequence, a layer comprising carbide of vanadium and of metal from said metal component metallurgically bonded to said metal component; a layer of metal consisting essentially of vanadium or vanadium alloy metallurgically bonded to said layer of carbide; a zone of interdiffused metals comprising platinum and vanadium, said zone being metallurgically bonded to said layer of vanadium or vanadium alloy and a continuous layer consisting essentially of metal selected from the group consisting of platinum and platinum alloys, said continuous layer being metallurgically bonded to both said zone and said graphite body.

4,641,335

PRIMARY-BEAM COLLIMATOR FOR STEREO RADIOGRAPHIC X-RAY DIAGNOSTIC APPARATUS

Alfred Hahn, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,321
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422343
Int. Cl.[4] G21K 1/04
U.S. Cl. 378—153 1 Claim



1. An improvement to a stereo radiographic X-ray apparatus comprising first, second and third spaced-apart radiation focal points arranged such that the first and second focal points lie in a plane and the third focal point is located intermediate the first and second focal points in the plane, the improvement comprising:

first and second pairs of X-ray opaque shutter leaves, each pair of shutter leaves being associated with a corresponding one of the first and second focal points and positioned to collimate radiation therefrom in planes which are perpendicular to said plane and comprising an internal shutter leaf and an external shutter leaf which are so positioned that the two internal shutter leaves are adjacent each other between the two external shutter leaves and radiation from the third focal point can be collimated by the two internal shutter leaves; and

means for independently moving the shutter leaves, such that each of the said pairs of shutter leaves can individually collimate radiation from its corresponding focal point for stereo radiography and the two internal shutter leaves can alternatively collimate radiation from the third focal point and to close shutter apertures through which radiation from the first and second focal points is directed.

4,641,336

FILTER ARRANGEMENT FOR SOFT TISSUE

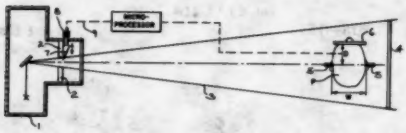
Jan Glstrin, Espoo, Finland, assignor to Instrumentarium Corp., Finland

Filed Jan. 6, 1984, Ser. No. 568,887
Claims priority, application Finland, Jan. 7, 1983, 830043
Int. Cl.[4] G21K 3/00
U.S. Cl. 378—156 7 Claims

1. A soft tissue filter arrangement for providing proper soft tissue exposure in combination with a cephalographic apparatus that images a patient's skull in a sagittal plane, said cephalographic apparatus having a source projecting an X-ray beam along a line of projection extending from the source to an imaging medium, said apparatus having a pair of spaced positioning means disposed between the X-ray beam source and the imaging medium, said pair of positioning means defining a line extending intermediate them that is perpendicular to the imaging medium, said positioning means being engagable with

the sides of the patient's head for positioning the skull of the patient with the sagittal plane parallel to the imaging means, said soft tissue filter arrangement comprising:

measuring means located opposite the positioning means and spaced therefrom in a direction normal to the intermediate line, said measuring means being movable toward and away from the positioning means in the direction normal to the intermediate line for application to one of the forehead or nasion of the patient, said measuring means providing an indication of the dimension between said measuring means when applied to the forehead or nasion and



the intermediate line of the positioning means, said dimension being measured in a direction parallel the patient's sagittal plane; and

a generally V-shaped X-ray filter means of fixed shape, said filter means being located to one side of said measuring means and the positioning means with respect to the X-ray beam line of projection, said filter means being adjustably insertable in the X-ray beam normal to the line of projection in accordance with the indication obtained from said measuring means for being positioned relative to the soft tissue of the patient.

4,641,337

KEY TELEPHONE SYSTEM WITH MEANS FOR OPERATIVELY CONNECTING ANOTHER KEY TELEPHONE SYSTEMS

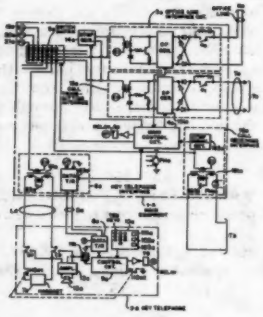
Jouji Tanaka; Tetsuobu Watanabe, both of Kawasaki; Yoshiji Tanimoto, and Minoru Okumura, both of Tokyo, all of Japan, assignors to Nitsuko Limited, Kawasaki and Nippon Telegraph and Telephone Corporation, Tokyo, both of, Japan

Filed Mar. 25, 1986, Ser. No. 843,707

Claims priority, application Japan, Mar. 25, 1985, 60-58540; Mar. 25, 1985, 60-58541

Int. Cl.[4] H04Q *5/20*

U.S. Cl. 379—162 **9 Claims**



1. In a key telephone system comprising a main equipment connected to at least one office line and a plurality of key telephone sets connected to said main equipment, said main equipment comprising an office line interface circuit connected to said office line, a plurality of key telephone interface circuits connected to said key telephone sets, respectively, a switching matrix having cross points for selectively connecting one of said key telephone interface circuits to another one and for selectively connecting said office line interface circuit to one of said key telephone interface circuits, and a main control means connected to said office line interface circuit, said key telephone interface circuits, and said switching matrix and for controlling said switching matrix to perform selected cross-point switching in response to a call request signal, the improvement wherein each of said key telephone sets comprises a system selection key for producing a system call request signal by pushing said system selection key, said main equipment comprising a system interface circuit to be connected to another key telephone system through a connecting line, said switching matrix comprising cross points for selectively connecting one of said key telephone interface circuits to said system interface circuit, and said main control means controlling said switching matrix in response to said system call request signal to connect one of said key telephone interface circuits to said system interface circuit, whereby said key telephone sets may be operatively connected to said another key telephone system through said connecting line.

4,641,338

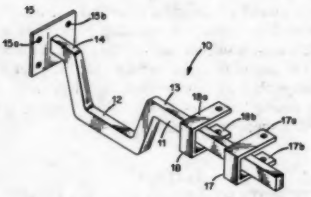
UNITARY TELEPHONY FRAME ARM EXTENDER

Roger L. Clark, Grabill; Dennis D. Ray, Fort Wayne, and James L. Martin, Avilla, all of Ind., assignors to General Telephone Company of Indiana, Westfield, Ind.

Filed Jul. 8, 1985, Ser. No. 752,866

Int. Cl.[4] H04M *3/00*

U.S. Cl. 379—328 **1 Claim**



1. A unitary telephony main distribution frame arm extender comprised of:

(a) a unitary bar having two aligned segments one of which is substantially longer than the other; and

a generally U-shaped segment joining said aligned segments;

(b) a flange permanently attached to the shorter of said aligned segments, and adapted for mounting a terminal block;

(c) at least two unitary C-shaped members permanently attached to the larger of said aligned segments, each of said C-shaped members (C-members) including two parallel legs extending orthogonally from said bar and adapted to engage an arm of a telephony main distribution frame.

4,641,339

VARIABLE BANDWIDTH HANDSFREE TELEPHONE USING SWITCHED CAPACITOR FILTERING

William O. Stottlemyer, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,438

Int. Cl.[4] H04B *3/20*; H04M *9/08*

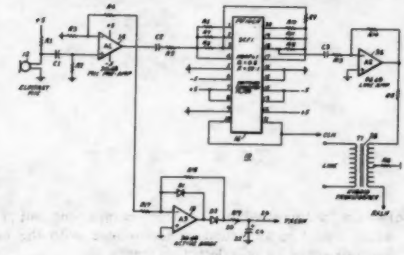
U.S. Cl. 379—391 **2 Claims**

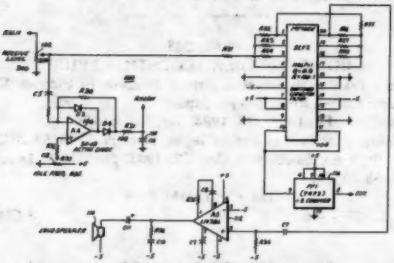
1. A circuit for providing isolation between two communication signals transmitted in two communication channels, on a transmission path having a frequency bandwidth, comprising:

means for providing separate portions of the frequency bandwidth of said transmission path respectively for each of said channels at selected times, said providing means including a switched capacitor filter in each channel, and a clocking circuit for monitoring the communication signal levels of said two channels and generating an output

having a frequency indicative of a stronger of the two signals; and

means for controlling said providing means to prevent simultaneous overlapping in time of the portions, such that the clocking circuit output frequency is varied and controls the bandwidth of each of said channels, as a function of





said stronger of the two signals, said means for controlling including a voltage controlled oscillator responsive to the output of said clocking circuit for varying the switching frequencies of the switched capacitor filters in each channel to maintain a predetermined degree of signal isolation between said channels.

4,641,340

Patent Not Issued For This Number

4,641,341

AUTOMATIC MULTI-SYSTEM AM STEREO RECEIVER USING EXISTING SINGLE-SYSTEM AM STEREO DECODER IC

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Filed Aug. 28, 1985, Ser. No. 770,170

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—15 **5 Claims**

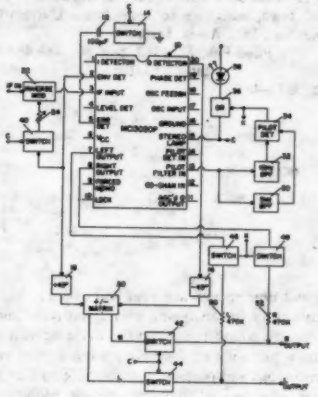
1. An AM stereo receiver capable of receiving signals representative of at least first and second different types of AM stereo systems, but using an integrated circuit (IC) stereo signal decoder designed to properly decode only received signals representing said first type of AM stereo system, comprising:

means for receiving AM radio frequency signals and for converting said signals to corresponding intermediate frequency (IF) signals;

first means, including an IC designed to properly decode received IF signals representing said first type of AM stereo system, for developing a first pair of left (L) and right (R) stereo audio signals from received IF signals which represent said first type of AM stereo system;

second means, coupled to said IC, for adapting said first means so as to develop a second pair of (L) and (R) stereo audio signals from received IF signals which represent said second type of AM stereo system; and

means coupled to said first and second means for selecting one or the other of said pairs of (L) and (R) stereo audio



signals and for coupling the selected pair to (L) and (R) audio outputs of said receiver.

4,641,342

VOICE INPUT SYSTEM

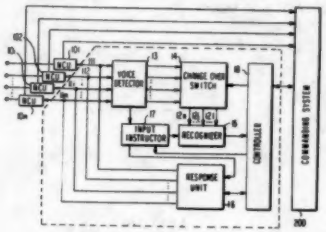
Takao Watanabe, and Masao Watari, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,660

Claims priority, application Japan, Mar. 17, 1983, 58-44741; Feb. 8, 1984, 59-21115

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—41 **8 Claims**



1. A voice input system, comprising:

an input cue signal generating means for producing a first cue signal informing the user that the system is ready to receive the voice input;

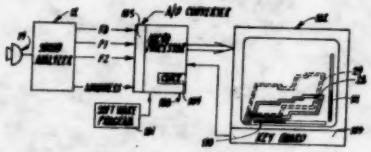
a voice detection means for producing a detection signal when the voice signal is being inputted; and

an input instructing means for ordering said input cue signal generating means to issue a second input cue signal when said detection signal exists prior to the end of said input cueing signal.

4,641,343
REAL TIME SPEECH FORMANT ANALYZER AND DISPLAY

George E. Holland; Walter S. Struve, and John F. Homer, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Feb. 22, 1983, Ser. No. 468,463
Int. Cl.[4] G10L 7/10
U.S. Cl. 381—48 5 Claims



1. A real time speech analyzer and display, comprising:

a first circuit for analyzing sound and including means for receiving sound input and for dividing said sound input into a plurality of frequency ranges, said ranges being continuous and partially overlapping so that there are no gaps between said frequency ranges, each said frequency range containing a frequency formant for said sound input;

converting means in said circuit for converting said sound input in said frequency ranges to proportional voltages representing the frequency content of said sound;

a microprocessor circuit

for processing the voltages from the converting means and including analog to digital converting means for converting the voltages to digital signals, said microprocessor circuit being adaptable for operative use with software programming means for performing a plurality of processing operations on the digital signals;

a second circuit connecting said first circuit and said microprocessor circuit for conveying all of the voltages from said converting means to said microprocessor circuit, said voltages representing the sound input contained in said continuous, partially overlapping frequency ranges;

a display means connected to said microprocessor circuit for visually presenting traces derived from the output of said microprocessor circuit and representing said sound input; and

a control means operatively connected to said microprocessor circuit and said display means for controlling the display of said traces.

4,641,344
AUDIO EQUIPMENT

Junichi Kasai, Yokohama, and Hiroshi Imai, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 4, 1985, Ser. No. 688,992
Claims priority, application Japan, Jan. 6, 1984, 59-1214; Feb. 24, 1984, 59-33797; Jul. 2, 1984, 59-135171
Int. Cl.[4] H03G 3/20
U.S. Cl. 381—57 25 Claims

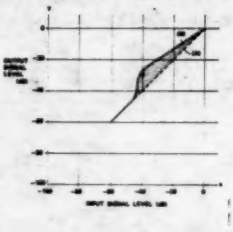
1. Audio equipment comprising:

(a) means for producing an audio signal;

(b) means for detecting the level of noise surrouding the audio equipment;

(c) means for controlling a dynamic range of the audio signal in accordance with the detected noise level;

(d) means for reproducing the controlled audio signal; and

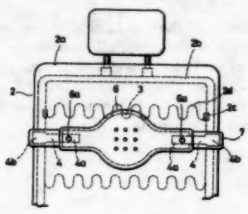


(e) means for filtering high frequency components out of the audio signal to an extent in accordance with the noise level detected by said detection means.

4,641,345
BODY-SENSIBLE ACOUSTIC DEVICE

Yoshio Takahashi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 686,965
Claims priority, application Japan, Dec. 29, 1983, 58-203576; Dec. 29, 1983, 58-203582; Dec. 29, 1983, 58-203588; Dec. 29, 1983, 58-203592
Int. Cl.[4] H04M 1/04
U.S. Cl. 381—86 8 Claims



1. A body-sensible acoustic device, comprising:

a drive unit which is driven by acousto-electrical signals;

a vibration transmitting member on which said drive unit is mounted; and

a pair of clamping members which are coupled to said vibration transmitting member in such a manner as to be slidable with respect to said vibration transmitting member and swingable in a plane including said vibration transmitting member, each clamping member having an arm for holding a side frame provided in a seat body.

4,641,346
SYSTEM FOR THE PRINTING AND READING OF ENCRYPTED MESSAGES

John I. Clark, Milford; Alton B. Eckert, Norwalk, both of Conn., and David M. Warren, Woodmere, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 21, 1983, Ser. No. 515,760
Int. Cl.[4] G06H 9/00; H04L 9/00
U.S. Cl. 380—3 24 Claims

1. A device for the metering of encrypted postage and similar indicia comprising:

(a) an entry means for the entry of data;

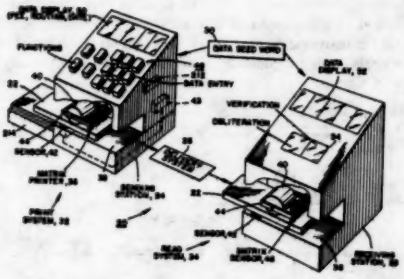
(b) means coupled to said entry means for storage of said data;

(c) character generator means coupled to said storage means, said character generator means comprising a mem-

ory for storage of character dots in a dot matrix display of characters, and means for reading out data from said memory in a row-by-row format of said matrix;

(d) an encryption circuit coupled to said storage means for developing a code word that is a function of said data;

(e) means for imprinting a dot matrix display of characters of



the data stored in said memory and read out via said reading means means; and

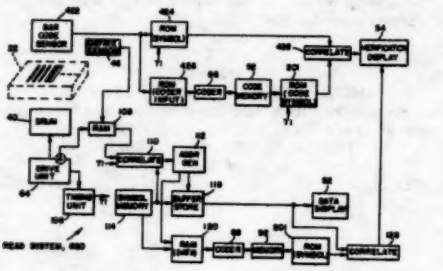
(f) means coupled to said character generator means and to said encryption circuit for selectively displacing determined dots in said matrix display of characters in accordance with said code word of said encryption circuit without changing the identity of the character.

4,641,347

SYSTEM FOR PRINTING ENCRYPTED MESSAGES WITH A CHARACTER GENERATOR AND BAR-CODE REPRESENTATION

John I. Clark, Milford, and Daniel F. Dlugos, Huntington, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 18, 1983, Ser. No. 515,072
Int. Cl.[4] G06K 9/00; H04L 9/00
U.S. Cl. 380—3 **23 Claims**



1. A device for the metering of encrypted postage and similar indicia comprising:

an entry means for the entry of data;

means coupled to said entry means for the storage of said data;

an encryption means for developing a code word representing said data;

means for imprinting a dot matrix display of alphanumeric characters in response to the application of signals thereto;

means producing code symbols representing said data;

means responsive to said code symbols and to said data stored in said storage means for commanding said dot matrix imprinting means to print said code symbols in series with characters corresponding to data stored in said storage means;

means for imprinting a bar-code representation of data applied thereto; and

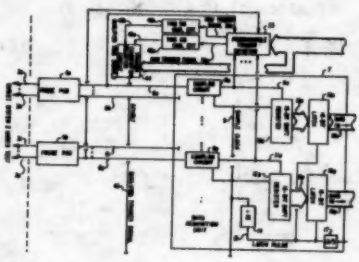
means synchronized with said dot matrix imprinting means and said bar-code imprinting means, and responsive to data stored in said storage means and said code word for alternately feeding data of said storage means and a code word to said bar-code imprinting means.

4,641,348

TIMING OR LOGIC STATE ANALYZER WITH AUTOMATIC QUALIFIED INFERENTIAL MARKING AND POST PROCESSING OF CAPTURED TRACE DATA

David L. Neuder, and Joel A. Zellmer, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 9, 1983, Ser. No. 550,322
Int. Cl.[4] G01R 13/32; G06K 9/00
U.S. Cl. 382—1 **38 Claims**



1. Apparatus for monitoring a plurality of signals in a system under test, the apparatus comprising:

means for sampling the values of a plurality of source signals in a workpiece system, for determining the logic values of the samples according to selected thresholds and polarities and for producing according to the samples a plurality of logic signals having successive collections of corresponding logic signal values;

means coupled to the logic signals for storing the individual logic signal values within each successive collection thereof;

means for defining a logic condition upon at least two consecutive collections of logic signal values and for associating a symbol with the defined logic condition;

means responsive to the defined logic condition for searching through the stored logic signal values and for identifying instances therein corresponding to the defined logic condition; and

means coupled to the stored collections of logic signal values and responsive to the identified instances for reconstructing an indication of the activity of the plurality of source signals as recorded by the stored successive collections of logic signal values, the reconstructed indication including for each identified instance of the defined logic condition the symbol associated therewith.

4,641,349

IRIS RECOGNITION SYSTEM

Leonard Flom, 1903 Post Rd., Fairfield, Conn. 10403, and Aran Safir, 3 Ellsworth Ave., Cambridge, Mass. 02130

Filed Feb. 20, 1985, Ser. No. 703,312
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—2 **32 Claims**

1. A method of identification of a person, comprising:

storing image information of at least a portion of the iris and pupil of the person's eye;

illuminating an eye, of an unidentified person having an iris and a pupil;

obtaining at least one image of at least the same portion of the iris and pupil of the eye of the unidentified person; and

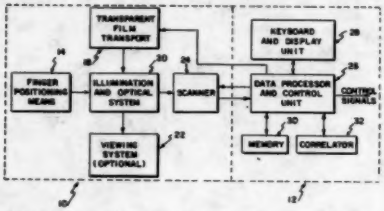
comparing at least the iris portion of the obtained image with the stored image information to identify the unidentified person.

4,641,350

FINGERPRINT IDENTIFICATION SYSTEM

Robert F. Bunn, 6803 Pamela La., Clinton, Md. 20735

Filed May 17, 1984, Ser. No. 611,131
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—4 **20 Claims**



1. A machine method of comparing an M×N data array to an X×Y data array, said arrays being representative of fingerprint patterns, comprising the steps of:

A. dividing said X×Y array into a plurality of sub-arrays;

B. comprising elements of a sub-array of said X×Y array with elements of said M×N array and generating a correlation value indicative of the degree of correlation existing between corresponding elements;

C. repeating step B for a plurality of sub-arrays of elements of said M×N array;

D. identifying a highest correlation value generated in step C;

E. repeating steps B, C and D for each sub-array of said X×Y array;

F. identifying a relative location of said sub-arrays corresponding to said highest correlation values to provide a measure of relative distortion of said fingerprint patterns; and

G. comparing said highest correlation values and said measure of relative distortion to respective predetermined threshold values.

4,641,351

LOGICAL TRANSFORM IMAGE PROCESSOR

Kendall Preston, Jr., 5701 E. Glenn St., Bldg. 36, Tucson, Ariz. 85712

Filed Jul. 25, 1984, Ser. No. 634,261
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—6 **20 Claims**

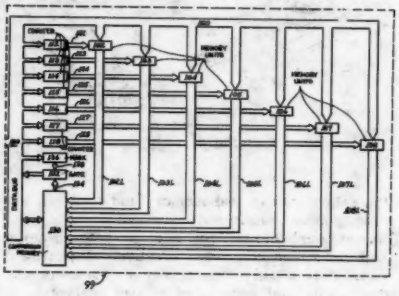
1. An apparatus for processing at least one central voxel in a neighborhood of voxels of a multi-dimensional scene of at least three dimensions, comprising:

acquisition means for acquiring a first plurality of signals, each of said signals representative of a voxel, a plurality of said voxels representative of a multi-dimensional scene of at least three dimensions, said plurality of said voxels arranged in rows, said voxels equally spaced along said rows, said rows in parallel to each other;

storage means for storing said first plurality of signals representing said multi-dimensional scene;

first retrieval means for retrieving at least one of said first plurality of said signals representative of at least one central voxel;

second retrieval means for retrieving a second plurality of said signals representative of at least one multi-dimensional neighborhood of at least three dimensions around said at least one central voxel, said second plurality of said signals being substantially a subset of said first plurality of said signals;



pattern means for providing a plurality of pre-determined pattern signals representative of an plurality of pre-determined multi-dimensional neighborhoods of at least three dimensions around at least one pre-determined central voxel;

comparison means for comparing said second plurality of said signals representative of said multi-dimensional neighborhood of at least three dimensions around said at least one central voxel to said pre-determined pattern signals;

processing means for processing said at least one central voxel in response to said comparison means; and

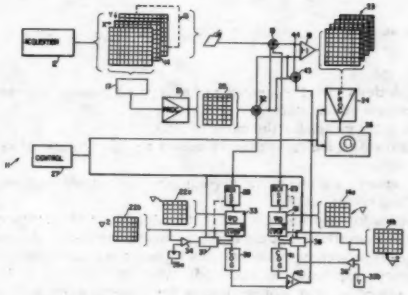
transmitting means for transmitting said at least one processed central voxel.

4,641,352

MISREGISTRATION CORRECTION

Paul Fenster; Yair Shimoni; Bilha Nissenson, and Noam Alperin, all of c/o Elscint Ltd., Box 5258, Haifa, Israel

Filed Jul. 12, 1984, Ser. No. 630,326
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—6 **38 Claims**



1. A method for correcting for artifacts generated by relative motion between an imaging system and items within a subject being imaged, the motion causing misregistration between different images of the same subject temporally separated and the misregistration causing the artifacts when the

different images are merged, said method comprising the steps of:

obtaining gray level density data for different images of the same subject, said gray level density data including items wherein the gray level density data normally changes as a function of time during a scan period and items wherein the gray level denstiy normally remains substantially the same as a function of time during a scan period;

said items wherein the gray level density data normally remains substantially the same displaying primary and possibly secondary characteristics;

selecting a point on an item displaying gray level density data that normaliy remains substantially the same,

locating said point in said different images;

reducing the effects of the secondary characteristics in the step of locating said point;

obtaining a vector value of the motion causing the misregistration to determined differences between the locations of the point in said different images; and

using said vector value to correct the misregistration between the different images.

4,641,353

INSPECTION METHOD AND APPARATUS FOR A MASK PATTERN USED IN SEMICONDUCTOR DEVICE FABRICATION

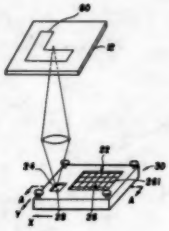
Kenichi Kobayashi, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 10, 1984, Ser. No. 648,911

Claims priority, application Japan, Sep. 16, 1983, 58-170796

Int. Cl.[4] G06K 9/00, 9/60

U.S. Cl. 382—8 **24 Claims**



1. An inspection method for a mask pattern used in semiconductor fabrication which uses an optical system for exposing said mask pattern on a fabricated object and printing said mask pattern; thereon, the inspection method comprising the steps of:

projecting an optical image of said mask pattern onto an image sensor provided on a stage having said fabricated object mounted thereon;

converting said optical image into a sensor video signal;

generating a data video signal from design data used in fabricating said mask pattern, and

comparing said sensor video signal to said data video signal for determining whether said mask pattern is normal.

4,641,354

APPARATUS FOR RECOGNIZING AND DISPLAYING HANDWRITTEN CHARACTERS AND FIGURES

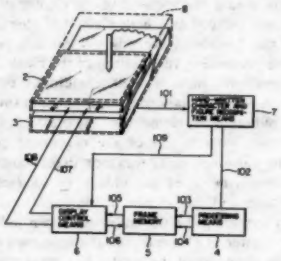
Yasushi Fukunaga, Hitachi; Soshiro Kuzunuki, Katsuta; Hiroshi Shojima, Hitachi; Takanori Yokoyama, Hitachi; Kazuyoshi Koga, Hitachi; Kotaro Hirasawa, Hitachi, and Shinichi Kawada, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 716,944

Claims priority, application Japan, Mar. 30, 1984, 59-60717

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—13 **12 Claims**



1. An apparatus for recognizing and displaying handwritten characters and figures comprising input means for reading input stroke information as to a character and a figure each inputted by handwriting, recognition means for carrying out character/figure recognition on the basis of features of the input stroke information, display means including a display screen for displaying the input stroke information and the result of recognition, and processor means responsive to information received from said recognition means for controlling said display means so that said input stroke information is initially displayed on said display screen, and thereafter the result of recognition of the input stroke information as indicated by said recognition means is displayed and the input stroke information which has been used for that recognition is erased from said display screen, while input stroke information which has not contributed to said recognition is retained on said display screen.

4,641,355

PATTERN RECOGNITION APPARATUS

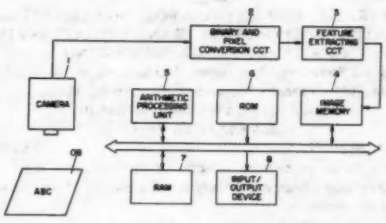
Yusuo Hongo, and Yoshio Nitta, both of Tokyo, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Jan. 25, 1984, Ser. No. 573,812

Claims priority, application Japan, Jan. 26, 1983, 58-9806

Int. Cl.[4] G06K 9/62

U.S. Cl. 382—34 **2 Claims**



1. A pattern recognition apparatus comprising a binary conversion means for converting signals generated from a pattern such as a character or figure recorded on a given medium into binary values, a threshold level feature extracting

means for segmenting the binary pattern values and extracting features of the segments, memory means for storing extracted pieces of information and arithmetic means including means for defining a circumsquare of a given size on an unknown pattern, means for dividing said circumsquare into a plurality of meshes, means for computing a bit matrix of the unknown pattern dependent on whether a segment is present in each of the meshes, means for computing a cluster of characters of the unknown pattern by effecting a prescribed operation on the bit matrix, means for computing deviations serving as indices indicative of similarity between the cluster of characters of the unknown pattern and clusters of characters of respective registered patterns, means for registering the cluster of characters of the unknown pattern as a new cluster of characters when each one of the deviations exceeds a respective preset value, and means for preventing registration of the cluster of characters of the unknown pattern as a new cluster of characters when each one of the deviations does not exceed the respective preset value, wherein the elements of the clusters of characters of the unknown pattern and of the registered patterns are classified into pattern, blank, mask or deformation elements and the deviation between the cluster of characters of the unknown pattern and that of one of the registered patterns is computed by summing the deviations between individual elements of the cluster of characters of the unknown pattern and corresponding elements of the cluster of characters of the one of the registered patterns, where:

(a) the deviation between a pattern element and another pattern element, a mask element or a deformation element is equal to 0;

(b) the deviation between a pattern element and a blank element is equal to 1;

(c) the deviation between a blank element and another blank element or a mask element is equal to 0;

(d) the deviation between a blank element and a deformation element is equal to 1, if all elements corresponding to the elements of the deformation string to which the deformation element belongs are also blank elements, and is otherwise equal to 0;

(e) the deviation between a mask element and a pattern element, a blank element, another mask element or a deformation element is equal to 0; and

(f) the deviation between a deformation element and a pattern element, a mask element or another deformation element is equal to 0.

4,641,356

APPARATUS AND METHOD FOR IMPLEMENTING DILATION AND EROSION TRANSFORMATIONS IN GRAYSCALE IMAGE PROCESSING

Stanley R. Sternberg, Ann Arbor, Mich., assignor to Machine Vision International Corporation, Ann Arbor, Mich.

Filed Aug. 24, 1984, Ser. No. 644,101

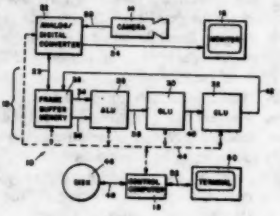
Int. Cl.[4] G06K *9/00*

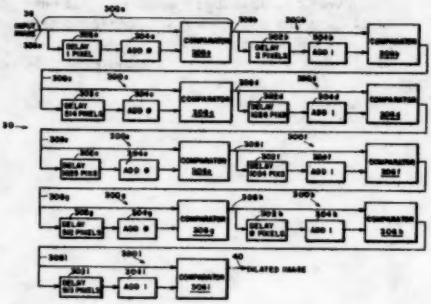
U.S. Cl. 382—49 **30 Claims**

1. An image processing system for processing at least one start grayscale image each made up of a matrix of points, said system comprising:

serializing means for producing at least one first serial signal including a plurality of multi-bit words each corresponding to one of the points of the associated start image;

delay means for delaying selected ones of the first signals to produce at least one delayed serial signal each corresponding to one of the first signals, said delay means including adder means for adding a desired value to each word delayed by said delay means; and





operating means for performing operations on selected ones of the delayed signals and the first signals to produce at least one output serial signal.

4,641,357

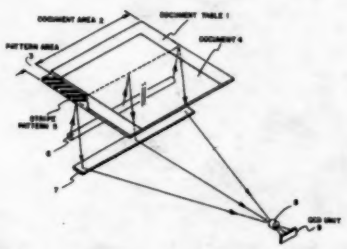
METHOD FOR READING A DOCUMENT IMAGE

Junichi Satoh, Chigasaki, Japan, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,776

Int. Cl.[4] G06K *9/18*

U.S. Cl. 382—61 **11 Claims**



1. In a document scanner for converting images on documents into corresponding electronically stored data signals—which operates by optically scanning a document along a line oriented in a first direction, converting images of scanned points along said line into corresponding electrical signals, storing representations of the electrical signals in a buffer store, and providing relative motion between the document and the scanning apparatus in a second direction perpendicular to said first direction to effect scanning of the document in said second direction by repeated scannings in said first direction in coordination with said motion—the improvement comprising:

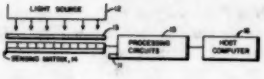
means separate from the document to be scanned providing a pattern of optically scannable reference lines inclined in a direction oblique to both said first and second directions;
means for optically scanning said pattern in a direction parallel to said first direction;
means providing relative motion in said second direction between said pattern and said pattern scanning means, in coordination with the relative motion between said document and said document scanning apparatus;
a buffer store;
means coupled to said pattern scanning means for detecting discrete increments of displacement of said pattern relative to said first direction corresponding to pel increments of displacement of said document in said second direction; and
means coupled to said displacement detecting means, said document scanning apparatus and said buffer store, for transferring samples of said electrical signals from said document scanning apparatus to said buffer store in conjunction with detections of successive discrete increments of displacement by said detecting means; whereby an image on a document may be effectively scanned in said second direction in uniform increments of displacement regardless of variations in and/or interruptions of the relative motion between the document and the document scanning apparatus.

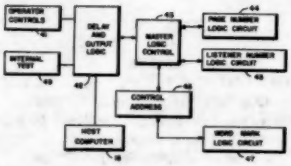
4,641,358

OPTICAL MARK READER

Bruce R. Archambeault, Nashua, N.H., and David P. Rancour, W. Lafayette, Ind., assignors to The United State of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 18, 1984, Ser. No. 662,476
Int. Cl.[4] G06K *9/20*
U.S. Cl. 382—68 **4 Claims**





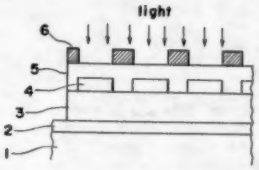
1. An apparatus for use with a host computer for detecting and locating discrete opaque regions a distal surface of a translucent sheet member, said apparatus comprising:
an illumination source illuminating said surface with electromagnetic wave energy;
a sensing means, said sensing means containing sets of an odd number of light sensitive transistor circuits, each of said sets being fixed in a proximate relationship to the distal surface of said sheet member, each set thereof being in register with a discrete region of said sheet member and having an output responsive to translucent and opaque conditions thereof;
voting circuits, each of which are electrically connected to one of said sets of said light sensitive transistor circuits in said sensing means, each of said voting circuits generating a vote signal of logic 1 when a majority of said light sensitive transistors in the set are covered by a mark and a logic 0 when a majority of said light sensitive transistor are not covered by a mark; and
a word output logic circuit which receives said vote signals from said voting circuits and reports said vote signals to said host computer.

4,641,359

TWO-DIMENSIONAL IMAGE READ-OUT DEVICE

Katsushi Okibayashi, Ikoma; Masataka Itoh, Tenri, and Shohichi Katoh, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1984, Ser. No. 629,339
Claims priority, application Japan, Jul. 11, 1983, 58-126317
Int. Cl.[4] G06K *9/28*
U.S. Cl. 382—68 **18 Claims**



1. A two-dimensional image read-out device comprising:
(a) a photoconducting layer having first and second surfaces;
(b) a plurality of X electrodes shaped as stripes applied on the first surface of said photoconducting layer and arranged in parallel with each other; and,
(c) a plurality of Y electrodes applied on the second surface of said photoconducting layer, opposite to the surface on which said X electrodes are applied, and arranged in parallel with each other in a direction perpendicular to said X electrodes;
said X and Y electrodes being made of electrically conductive material, with at least one of said pluralities of said X or Y electrodes being made of transparent or translucent material to allow the passage of a light from an image through said one of said pluralities of said X or Y electrodes to said photoconducting layer;
a side of said two-dimensional image read-out device upon which said light from said image is incident being covered by an opaque material except over a plurality of picture elements formed from said photoconducting layer which are positioned at the intersections of said X and Y electrodes.

4,641,360

CARRYING BAG WITH INTERLOCKING HANDLE PORTIONS

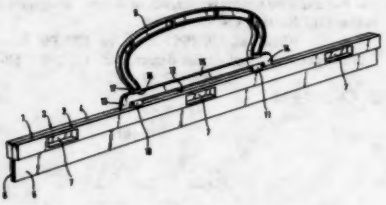
Helmut Frank, Munich, Fed. Rep. of Germany, assignor to Manzinger Papierwerke KG, Munich, Fed. Rep. of Germany

Filed Feb. 20, 1985, Ser. No. 703,399
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1984, 8405096[U]; Mar. 27, 1984, 8409385[U]; Jun. 29, 1984, 8419598[U]
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—15 **8 Claims**

1. A handle for a bag, said handle comprising:
a first stiffening bar adapted to be secured adjacent to a top of a bag on a first wall of the bag,
a second stiffening bar adapted to be secured adjacent to the top of the bag on a second wall of the bag which is located opposite to said first wall,
a U-shaped handle having a crosspiece and legs, said legs being integral with said first stiffening bar,
a U-shaped member having a crosspeice and legs, said legs being integral with said second stiffening bar,

a groove defined in each of the legs of said U-shaped handle at a portion of said legs adjacent to said first stiffening bar, said grooves being located at a distance above said first stiffening bar which is substantially equal to a distance that the crosspiece of said U-shaped member projects from said second stiffening bar,

a slot defined by said U-shaped member and said second stiffening bar for receipt of said U-shaped handle through said slot so that when said U-shaped handle is inserted through said slot, the crosspiece of said U-shaped member



fits within and is locked in place in said grooves by the weight of contents in the bag pulling downwardly on said stiffening bars, and

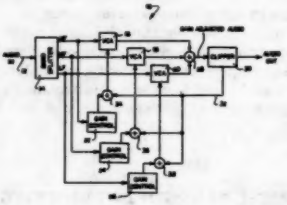
an opening defined between a lowermost surface of the crosspiece of the U-shaped handle and an uppermost surface of the crosspeice of said U-shaped member when the crosspiece of said U-shaped member is locked in said grooves, said opening receiving the hand of a person grasping the bag by the crosspiece of said U-shaped handle.

4,641,361

MULTI-BAND AUTOMATIC GAIN CONTROL APPARATUS

Thomas J. Rosback, Quincy, Ill., assignor to Harris Corporation, Quincy, Ill.

Filed Apr. 10, 1985, Ser. No. 721,903
Int. Cl.[4] H03G *3/00*
U.S. Cl. 381—103 **20 Claims**



1. Audio signal processing apparatus comprising:

band splitter means responsive to an input audio signal for separating the audio signal into plural frequency components;

plural gain adjustment means for each controlling the gain of an associated one of said components, each said gain adjustment means including variable gain means for gain adjusting the corresponding component, and feed forward control means for controlling the gain of said variable gain means as a function of the magnitude of the associated said component;

signal combining means for combining the gain adjusted components provided by said plural gain adjustment means to thereby form a gain adjusted audio signal; and

limiter means for preventing the combined signal from exceeding predetermined amplitude constraints, said limiter means including means for simultaneously reducing the gains of all said variable gain means whenever said gain adjusted audio signal exceeds said constraints.

4,641,362

PROTECTIVE DISPENSING ASSEMBLY FOR ULTRAPURE LIQUIDS

Charles B. Muller, Houston, Tex., assignor to C. Muller & Associates, Inc., Houston, Tex.

Filed Oct. 25, 1984, Ser. No. 664,854
Int. Cl.[4] B65D *30/10*
U.S. Cl. 383—115 **11 Claims**

1. A flexible inert dispensing container construction for ultra pure ultrapure liquid materials, comprising:

(a) a pair of fluorocarbon sheets disposed in heat sealed assembly with one another and defining an internal chamber for containing ultrapure liquid material, said fluorocarbon sheets cooperatively forming a bottom opening, each of said fluorocarbon sheets forming an integral tab located below said bottom opening;

(b) a length of fluorocarbon tubing extending through said bottom opening and having one end thereof in communication with said internal chamber;

(c) said tabs of each of said fluorocarbon sheets being wrapped peripherally about said fluorocarbon tubing and being of a configuration forming a circumferential overlapping joint with said tubing which is of at least partially spiral-like form; and

(d) means securing said tab means in liquid tight assembly with said tubing.

4,641,363

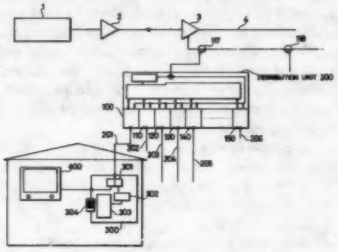
COMMUNITY ANTENNA TELEVISION COMMUNICATION SYSTEM

Yonosuke Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,809
Claims priority, application Japan, Sept. 19, 1984, 59-197628
Int. Cl.[4] H04N *7/18*
U.S. Cl. 455—4 **3 Claims**

1. A CATV communication system comprising: a plurality of subscribers' terminals, said subscribers' terminals being divided into groups, a center for producing television programs and for communicating bidirectionally with said subscribers' terminals, a plurality of distribution units, one of said distribution units being provided for each of said groups of subscribers' terminals, each of said distribution units being coupled between one of its group of subscribers' terminals and said center, each of said distribution units comprising a main central processing unit for performing bidirectional communications with said center, at least one subsidiary central processing unit for performing bidirectional communications with said subscribers' terminals, RAM and ROM memory means, ad-

dress and data bus means coupled to said memory means, and switching means for controlling access to said bus means by



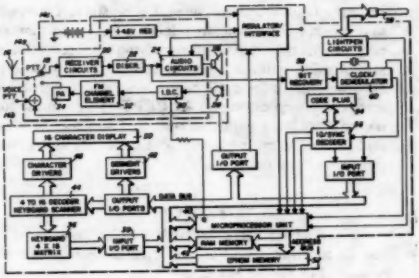
said main central processing unit and said subsidiary processing unit with priority to said main central processing unit.

4,641,364

FUNCTION CODING VIA DIGITAL ADDRESSES IN A TWO-WAY SYSTEM

Robert H. Bass, Sunrise; Macko, Tamarac, and Robert K. Lockhart, Jr., Lauderhill, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 8, 1978, Ser. No. 967,762
Int. Cl.[4] H04B 7/00
U.S. Cl. 455—32 **6 Claims**



1. An arrangement for providing increased channel efficiency in a two-way communications system which incudes a Control Unit and a multiplicity of satellite units, each unit being addressable by a unique two-word address, and comprising in combination:

a two-way communications link coupled between the Control Unit and each satellite unit;

detector means in the Control Unit and in each satellite unit for detecting the two-word coded address of the respective unit in signals received from the link;

logic means coupled to each detector means for detecting the complement of each respective address code word;

memory means coupled to each detector means and logic means for storing any detected combination of the respective address words and the word complements, and any immediately subsequent data;

microprocessor means coupled to the memory means in each unit for automatically providing at least one appropriate response to each detected address combination;

transmission means coupled to each microprocessor means for transmitting said responses to the communications link; and

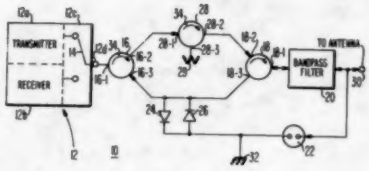
manual input means in each satellite unit for entering into the respective memory at least one combination of the words and word complements of the Control Unit address for providing at least one appropriate response to one received and detected combination of the respective satellite unit address words and the word complements.

4,641,365

OVERPOWER PROTECTION FOR A RADIO FREQUENCY TRANSCEIVER

Charles Montini, Jr., Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 23, 1984, Ser. No. 643,418
Int. Cl.[4] H04B 1/48
U.S. Cl. 455—78 **11 Claims**



1. A power limiter circuit for a radio frequency transceiver of the type which has a receiver portion, a transmitter portion and a transmit/receive switch coupled to the receiver portion, the transmitter portion and an antenna port, said power limiter comprising in combination:

a three port isolator;

first and second three port circulators, a first port of said first circulator being adapted for coupling to said antenna port on said transceiver, a first port of said second circulator being adapted for coupling to an antenna means, a second port of each of said two circulators being coupled to first and second ports respectively of said isolator to pass signal input at said first circulator first port to said second circulator first port, a third port of each of said two circulators being coupled together to pass a signal input at said second circulator first port to said first circulator first port; and

means for limiting the power received at said receiver portion of a signal input at said second circulator first port, said means comprising means coupled between the connection joining said third ports of said first and second circulators and circuit ground.

4,641,366

PORTABLE RADIO COMMUNICATION APPARATUS COMPRISING AN ANTENNA MEMBER FOR A BROAD-BAND SIGNAL

Yukio Yokoyama; Katsuji Kimura, both of Tokyo, and Naohisa Goto, Kanagawa, all of Japan, assignors to NEC Corporation and Naohisa Goto, both of, Japan

Filed Oct. 3, 1985, Ser. No. 783,823
Claims priority, application Japan, Oct. 4, 1984, 59-208627
Int. Cl.[4] H04B 1/38
U.S. Cl. 455—89 **7 Claims**

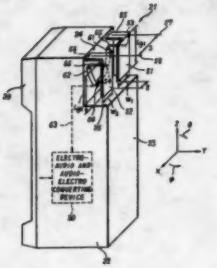
1. In a portable radio communication apparatus comprising a handset having a side surface, a recessed surface, and a connecting surface between said side and said recessed surfaces, an antenna member, a conductive plate member fixing said antenna member to said recessed surface so that said antenna member does not protrude outwardly of said side surface, electro-audio and audio-electro converting means housed in and coupled to said handset for converting a received electric signal to a received audio signal and a transmitting audio signal to a transmitting electric signal, and a conductive line member for feeding said transmitting electric signal to said antenna member and for receiving said received electric signal from said antenna member, the improvement wherein:

said antenna member comprises a first and a second antenna

having different resonance frequencies and a first and a second predetermined point, respectively;

said plate member comprising a first and a second conductive plate fixing said first and said second antennae to said recessed surface, respectively;

said conductive line member comprising a first, a second, and a common conductive line, said first and said second



conductive lines connecting said common conductive line to said first and said second predetermined points, respectively, said common conductive line being connected to said electro-audio and audio-electro converting means to feed said transmitting electric signal to said first and said second antennae and to receive said received electric signal from said first and said second antennae.

4,641,367

RECEIVER FOR FM SIGNALS WITH TRANSMITTER STATUS CODE STORAGE

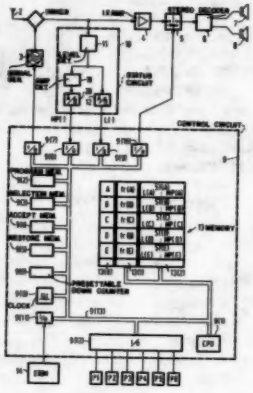
Theodorus H. M. Van Deursen, and Derk J. C. Wassink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 500,721, Jun. 3, 1983, abandoned. This application May 20, 1985, Ser. No. 736,518

Claims priority, application Netherlands, Jun. 15, 1982, 8202416

Int. Cl.[4] H03J 7/18; H04B 1/10

U.S. Cl. 455—161 **6 Claims**



1. In a receiver for receiving FM signals transmitted by a plurality of FM transmitters transmitting the same program at different carrier frequencies, said receiver having a first memory field having a plurality of addressable memory locations each storing a predetermined fixed tuning datum, each of said tuning datum corresponding to the frequency of one of said carrier frequencies, said receiver further having generator means for generating demodulator signals each having a frequency corresponding to a tuning datum applied to said generator means, and a mixing circuit connected to said generator means for generating mixing circuit output signals in response to received FM signals and said demodulator sigals, said mixing circuit output signals having at least one characteristic indicative of the quality of reception of said program at the carrier frequency corresponding to the so-applied tuning datum, the improvement comprising:

status circuit means having an input coupled to said mixing circuit for producing status code words signifying respective values of said quality-indicative characteristic of said mixer circuit output signals;

a second memory field having a plurality of addressable second memory locations, each storing a status code word associated with a corresponding tuning datum stored in said first memory field; and

control circuit means including a programmable processor connected to said status circuit means, first and second memory fields, generator means and mixing circuit for periodically upgrading reception, said control circuit means operable during a SELECT operation at predetermined time intervals for applying at least selected ones of said tuning datum from said first memory field sequentially to said signal generator means for tuning each of a plurality of FM signals, whereby said status circuit means creates a new status code word for each signal tuned in response to so-applied tuning datum, said control circuit means during said SELECT operation replacing said associated status code words in said addressable second memory field locations by said new status code words, said control circuit means selecting from said new status code words the code word signifying the highest value of said quanlity-indicative characteristic, thereby generating an optimum status code word, and said control circuit means applying during an ACCEPT operation the tuning datum associated with said optimum status code word to said generator means subsequent to one of said predetermined time intervals.

4,641,368

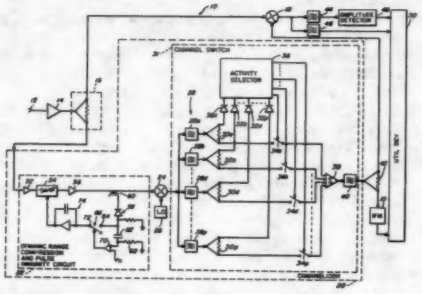
RADIO FREQUENCY RECEIVER

William B. Sullivan, Jr., Verona, N.J., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 423,411, Sep. 24, 1982, Pat. No. 4,535,286, which is a division of Ser. No. 90,811, Nov. 2, 1979, Pat. No. 4,363,139. This application Mar. 20, 1985, Ser. No. 716,784

Int. Cl.[4] H04B 1/16

U.S. Cl. 455—239 **2 Claims**



1. In a radio frequency receiver for receiving radio frequency continuous wave and pulse signals, the receiver having an automatic gain control circuit for controlling the receiver gain, the automatic gain control circuit being adapted to

change the receiver gain in response to the received continuous wave signals while not changing the receiver gain in response to the received pulse signals, the automatic gain control circuit comprising:

(a) variable attenuator means, fed by the received continuous wave and pulse signals, for attenuating such signals in accordance with a first control signal;

(b) limiting amplifier means fed by the variable attenuator means;

(c) detector means fed by the limiting amplifier means;

(d) integrator means for providing the first control signal;

(e) blocking means, fed by the detecting means, for passing rapidly varying detected signals and inhibiting slowly varying detected signals and direct current;

(f) comparator means, fed by the blocking means, for producing a second control signal when the amplitude of the signals from the blocking means exceeds a predetermined value; and

(g) coupling means, responsive to the second control signal, for selectively coupling the detector means and the integrator means;

wherein the coupling means decouples the detector means from the integrator means when a pulse signal is received.

4,641,369

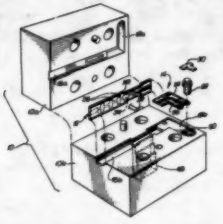
LOCAL OSCILLATOR AND MIXER ASSEMBLY

Albert J. Grote, Venice; Raghbir S. Tahim, Buena Park, and Kai Chang, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 29, 1984, Ser. No. 676,324

Int. Cl.[4] H04B 1/26

U.S. Cl. 455—327 **11 Claims**



1. A radio-frequency (rf) mixer and local oscillator assembly, comprising:

a conductive housing having an integral rf input waveguide;

oscillator means installed in the housing;

an rf mixer installed in the same housing and located in the rf input waveguide, for coupling an input rf signal directly to the mixer;

transmission line means coupled to the oscillator means and to the mixer, for transmitting a local oscillator (LO) signal from the oscillator means to the mixer; whereby the mixer and oscillator means are integrated into a single compact assembly.

an intermediate-frequency output line from the mixer, including low-pass filter means, the output line and low-pass filter means also being integrated into the same housing.

4,641,370

HOUSING ASSEMBLY FOR PORTABLE RADIO APPARATUS WITH ONE-PIECE BASEPLATE AND BATTERY CONTAINER

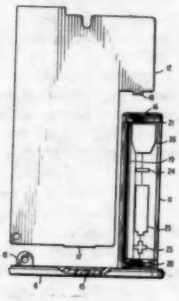
Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 571,270, Jan. 16, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 885,734

Claims priority, application Japan, Jan. 18, 1983, 58-4952[U]; Apr. 27, 1983, 58-63429[U]; May 13, 1983, 58-71231[U]

Int. Cl.[4] H04B 1/08

U.S. Cl. 455—348 **29 Claims**



15. A housing structure for a portable radio apparatus, comprising:

(a) a housing which is open at an end thereof and has a volume for accomodating said radio apparatus;

(b) an end closing member dimensioned to close the open end of said housing;

(c) a battery container section for containing a battery for said radio apparatus, said battery container section being molded integrally with said end closing member forming a part of said end closing member;

(d) a printed circuit board on which said radio apparatus is mounted, said board having a contour which conforms to said end closing member and to said battery container section, said end closing member and said battery container section supporting said board; and

(e) a locking mechanism for locking said printed circuit board to said end closing member and to said battery container section.

4,641,371

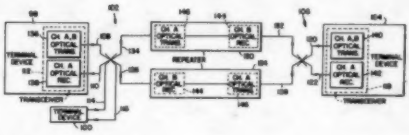
MULTI-STAR FIBER OPTIC NETWORK

Harold B. Shutterly, Edgewood Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1985, Ser. No. 692,254

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—601 **26 Claims**



1. A fiber optic network for interconnecting a plurality of terminal devices each having a transceiver with an optical transmitter for emitting optical signals and an optical receiver for receiving optical signals, comprising:

a first star having a plurality of light input and exit ports for connection to the optical transmitters and receivers, re-

spectively, of transceivers in terminal devices, said first star additionally having a further light input port and a further light exit port;

a second star having a plurality of light input and exit ports for connection to the optical transmitters and receivers, respectively, of transceivers in other terminal devices, said second star additionally having a further light input port and a further light exit port; and

means connecting said further light exit port of said first star to said further light input port of said second star and connecting said further light exit port of said second star to said further light input port of said first star for adding gain to optical signals conveyed from one star to the other while avoiding reflections back and forth between said stars, said means including an upstream repeater having optical receiver means for receiving an optical signal from said further light exit port of said first star and optical transmitter means for emitting an optical signal to said further light input port of said second star, and including a downstream repeater having optical receiver means for receiving an optical signal from said further light exit port of said second star and optical transmitter means for emitting an optical signal to said further light input port of said first star, the optical transmitter means of each repeater emitting optical signals to which the optical receiver means of the other repeater is insensitive,

wherein the optical transmitters in the transceivers of the terminal devices include means for emitting optical signals on a plurality of channels having the same optical wavelength, and wherein for each repeater the optical receiver means includes means for receiving optical signals on one channel and the optical transmitter means includes means for emitting optical signals on at least one different channel.

4,641,372

POWER FEEDING SUBMARINE TELECOMMUNICATIONS SYSTEMS

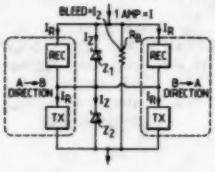
Patrick S. Kelly, London; Thomas Oswald; Alan J. Jeal, both of Dartford; Stephen E. Hill, South Darewth, and Robert Murphy, Sevenoaks, all of England, assignors to STC PLC, London, England

Filed Sep. 20, 1984, Ser. No. 652,467

Claims priority, application United Kingdom, Sep. 22, 1983, 8325430

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—601 **10 Claims**



1. A telecommunications system comprising:

a main cable which branches at a branching unit into two separate branch cables towards one end of the system;

the main cable and at least one of the branch cables having current-fed signal regenerators;

the branch cables each including a connection to a current supply source so that, during normal operation, electrical current for supplying a main path regenerator is fed via both branch cables;

the branch regenerator including a current by-pass circuit to automatically bypass any extra current beyond the requirements of the branch regenerator so that, in the event of a fault in the other one of the branch cables, the current supply to said one of the branch cables can be increased to fulfill the main path regenerator current requirement; and

said branching unit including means for preventing back current flowing back to earth at the fault.

4,641,373

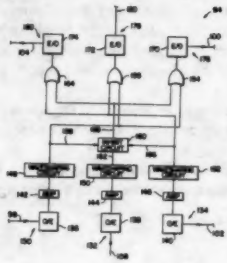
T-CONNECTION FIBER-OPTIC REPEATER

Harold B. Shutterly, Edgewood Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1985, Ser. No. 698,333

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—601 **26 Claims**



1. A T-connection fiber-optic repeater for use in a multi-star fiber-optic network, comprising:

first receiving means for receiving optical signals from a device at a first location and generating electrical signals corresponding thereto;

second receiving means for receiving optical signals from a star at a second location and generating electrical signals corresponding thereto;

third receiving means for receiving optical signals from a device at a third location and generating electrical signals corresponding thereto;

first transmitting means responsive to said electrical signals generated by said first and third receiving means for emitting optical signals to said star when said first or third receiving means receives optical signals;

second transmitting means responsive to said electrical signals generated by said second and third receiving means for emitting optical signals to said device at said first location when said second or third receiving means receives optical signals;

third transmitting means responsive to said electrical signals generated by said first and second receiving means for emitting optical signals to said device at said third location when said first or second receiving means receives optical signals; and

inhibit means connected to said first, second, and third receiving means for inhibiting said second and third transmitting means from responding to said electrical signals generated by said second receiving means whenever said first or third receiving means receives optical signals.

4,641,374

INFORMATION MEDIUM

Masumi Oyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 10, 1984, Ser. No. 639,422

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—603 **13 Claims**

1. An information medium used for receiving/delivering information from/to an exterior device, comprising:

receiver means for receiving a modulated input signal from the exterior device;

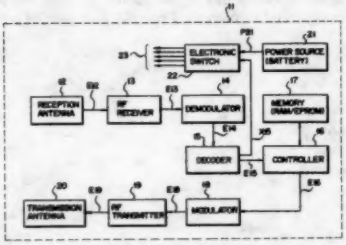
demodulator means coupled to said receiver means for demodulating said modulated input signal to provide specific

information which is formed of a binary signal having a given bit pattern;

decoder means coupled to said demodulator means for decoding said specific information to provide a decoded instruction corresponding to whatever binary signal is provided by said demodulator;

memory means for storing given data;

control means coupled to said decoder means and memory means, for controlling a write or read operation of said



memory means in accordance with the contents of said decoded instruction;

battery means for generating electric power; and

switch means coupled to said decoder means and battery means, for selectively activating any of said receiver means, demodulator means, memory means and control means by said electric power; the selection of said switch means for the power supply depending on the contents of said specific information.

4,641,375

LOCAL AREA NETWORK

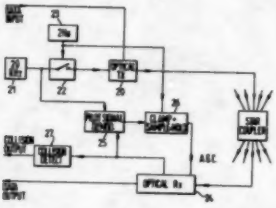
Andrew Dean, Stansted, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 7, 1985, Ser. No. 708,995

Claims priority, application United Kingdom, Mar. 8, 1984, 8406077

Int. Cl.⁴ H04B 9/00; H04J 1/02

U.S. Cl. 455—607 **3 Claims**



1. An optical fibre transmission system, which includes optical transceiver stations each having its transmitter coupled via a length of optical fibre to a star coupler and its receiver coupled via another length of optical fibre to the star coupler, so that with n stations there are 2n lengths of optical fibre coupled to the star coupler, wherein each said station includes means to generate a pilot signal specific to that station, which pilot signal is transmitted at a level which is low compared with the level used for data transmission, and wherein means in each said station receives its said pilot signal after it has passed from the station's transmitter via one length of optical fibre to the star coupler and from that star coupler via another length of optical fibre to the station's receiver, the level of the pilot signal being monitored on reception so that the attenuation to which signals conveyed via the system is monitored, wherein the pilot signal is a tone which is transmitted at a level which is low compared with that of data signals, e.g. of an amplitude 0.5% of a data signal, and wherein each said station connected to the star coupler is allocated its own tone frequency, further comprising:

a reference signal generator coupled by optical fibres to the star coupler which includes means, responsive to a calibration request from a said station sending a first reference signal, for emitting a signal at twice the frequency of the signal which it received, and

means at the said station to measure the signal level, and to adjust the station, on the basis of that level.

4,641,376

MULTI-CHANNEL MULTI-CELL OPTOELECTRONIC SWITCHING NETWORKS FOR MULTI-SERVICE TELECOMMUNICATIONS SYSTEMS

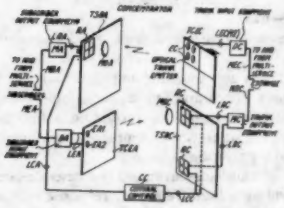
Boris Rozenwaig, 8, rue P.J. Redouté, 92360 Meudon-la-Foret, and Yves Robin-Champigneul, 4, rue Georges Ville, 75116 Paris, both of France

Continuation of Ser. No. 490,234, Apr. 29, 1983, abandoned. This application Aug. 27, 1985, Ser. No. 769,808

Claims priority, application France, Apr. 30, 1982, 82 07589

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—607 **10 Claims**



1. An optical switching network for selectively coupling plural input information signals to plural subscriber stations from a multi-service exchange that derives the information signals, the optical switching network comprising an array of optical transmitting cells responsive to said input signals so that an optical signal is derived by one of said cells in response to the information in each information signal, an array of optical receiving cells responsive to the optical signals derived by said transmitting cells, said receiving cell array being divided into plural zones each including at least the same number of cells as in the transmitting cell array, optical projection means between said arrays arranged so there is a correspondence of the information signals from the cells of the transmitting array with cells of each zone in the receiving array, each receiving cell deriving a first signal that represents the optical signal incident thereon, means for selectively coupling the first signals of each zone to a single output so that one output is provided for each zone, and means for combining the outputs of the plural zones onto a single signal transmitting structure that is coupled to the plural subscriber stations.

4,641,377

PHOTOACOUSTIC SPEAKER AND METHOD

William F. Rush, Tinley Park; James E. Huebler, Brookfield, and Peter Lysenko, Calumet City, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

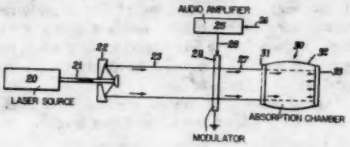
Filed Apr. 6, 1984, Ser. No. 597,705

Int. Cl.⁴ H04B 9/00

U.S. Cl. 381—111 **21 Claims**

1. A photoacoustic speaker comprising a laser beam source means, a modulating means capable of modulating the intensity of said laser beam in response to audio signal inputs producing a corresponding modulated laser beam, and an elongated

sealed gas absorption chamber having a laser transparent window in one end in the path of said laser beam, a rigid end opposite to said window, said gas absorption chamber having elongated thin flexible side walls, said two ends and said flexible side walls confining gas capable of absorption of said modulated laser beam thereby producing pressure waves which impinge on said elongated flexible side walls of said chamber to produce sound and transmit said sound exterior to said chamber.



4,641,378

FIBER OPTIC COMMUNICATION MODULE

Matthew L. McConnell, Boulder, and William A. Gibson, Lafayette, both of Colo., assignors to Raycom Systems, Inc., Boulder, Colo.

Filed Jun. 6, 1984, Ser. No. 617,905
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—619 1 Claim

1. A receiver circuit for a fiber optic receiver apparatus comprising:

detector means for transforming optical input signals received on a fiber optic link cable into electrical signals;

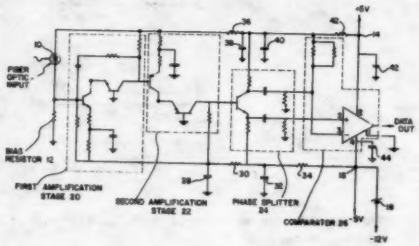
first amplifcation means for providing a first input impedance and a first predetermined amplification of said electrical signals comprising:

a first pair of transistors arranged in a cascode configuration for providing a high frequency response of said first amplification means by minimizing the effects of virtual capacitance in said transistor pair;

emitter degeneration means connected to one of said transistors for precisely controlling gain of said cascode configuration;

negative feedback means connecting the output with the input of the transistor pair for precisely controlling input impedance of said first amplification stage in response to said gain of said cascode configuration to provide a uniform response of said receiver circuit for response variations of said detector means;

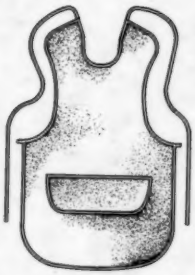
second amplification means for providing a second predetermined amplification of said electrical signals, said second amplification means having a second cascode transistor pair configuration connected to said first pair of transistors for providing a high frequency response of said amplification means by minimizing effects of virtual capacitance in said second transistor pair;



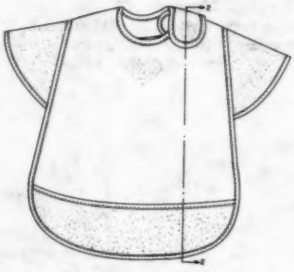
impedance converter means for providing a high input impedance to said second amplification stage, a low output impedance and a predetermined amplification of said electrical signals and further comprising a common emitter configuration having a collector and emitter output; and

comparison means connected to the collector and emitter output for producing an output signal whenever the electrical signals from said converter means exceed a predetermined threshold level.

288,020
APRON
Celeen K. Miller, P.O. Box 124 - R.R. #1, Perkasie, Pa. 18944
Filed Sep. 17, 1984, Ser. No. 651,097
Term of patent 14 years
U.S. Cl. D2—226



288,021
BIB WITH STRAIGHT ARMS
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,261
Term of patent 14 years
U.S. Cl. D2—227



288,022
BIB WITH LONG SLEEVES
Karen D. Marconi, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,868
Term of patent 14 years
U.S. Cl. D2—227

288,023
NOVELTY SUN VISOR
Jennifer Laughlin, Clearwater, Fla., assignor to B. O. Wyss, St. Louis, Mo.; E. L. Wyss, Alton, Ill. and R. G. Heywood, St. Louis, Mo., part interest to each
Filed Apr. 26, 1984, Ser. No. 603,915
Term of patent 14 years
U.S. Cl. D2—252

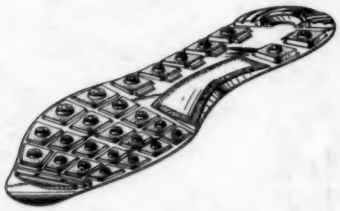
288,024
NOVELTY SUN VISOR
Jennifer Laughlin, Clearwater, Fla., assignor to B. O. Wyss, St. Louis, Mo.; E. L. Wyss, Alton, Ill. and R. G. Heywood, St. Louis, Mo., part interest to each
Filed Apr. 26, 1984, Ser. No. 603,921
Term of patent 14 years
U.S. Cl. D2—252

288,025
NOVELTY SUN VISOR
Jennifer Laughlin, Clearwater, Fla., assignor to B. O. Wyss, St. Louis, Mo.; E. L. Wyss, Alton, Ill. and R. G. Heywood, St. Louis, Mo., part interest to each
Filed Apr. 26, 1984, Ser. No. 604,217
Term of patent 14 years
U.S. Cl. D2—252

288,026
NOVELTY SUN VISOR
Jennifer Laughlin, Clearwater, Fla., assignor to B. O. Wyss, St. Louis, Mo.; E. L. Wyss, Alton, Ill. and R. G. Heywood, St. Louis, Mo., part interest to each
Filed Apr. 27, 1984, Ser. No. 604,539
Term of patent 14 years
U.S. Cl. D2—252

288,027
FLEXIBLE SOLE FOR ATHLETIC SHOE
Raymond F. Tonkel, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.
Continuation-in-part of Ser. No. 618,914, Jun. 8, 1984. This application Nov. 23, 1984, Ser. No. 674,535
Term of patent 14 years
U.S. Cl. D2—320

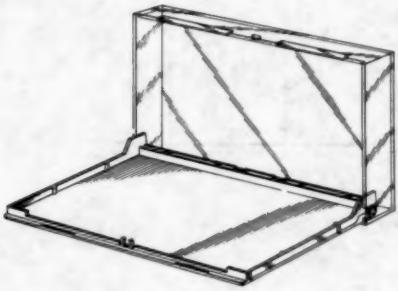
288,028
SHOE SOLE
Jacques Chassaing, Neuwiller Les Saverne, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France
Filed Nov. 1, 1983, Ser. No. 547,630
Claims priority, application France, May 3, 1983, 831642
Term of patent 14 years
U.S. Cl. D2—320



288,029
NECKWRAP
Robert G. Parr, 220 Yonge Street, P.O. Box 504, Galleria Offices Eaton Centre, Toronto, Canada (M5B 2H1)
Filed Oct. 30, 1984, Ser. No. 675,134
Term of patent 14 years
U.S. Cl. D2—602

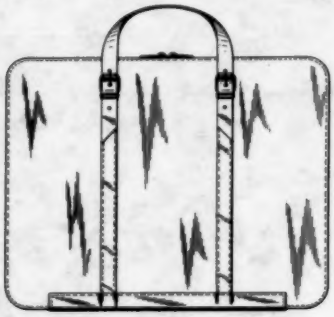
288,030
BOOTJACK
Charles L. Lauhoff, Rte. 2, Box 578, Amarillo, Tex. 79101
Filed Jun. 22, 1984, Ser. No. 623,415
Term of patent 14 years
U.S. Cl. D2—642

288,031
CASSETTE STORAGE CONTAINER
Paul J. Gelardi, Cape Porpoise, and Robert B. MacLeod, Jr., Biddeford, both of Me., assignors to Shape Inc., Biddeford, Me.
Filed Jun. 7, 1984, Ser. No. 618,235
Term of patent 14 years
U.S. Cl. D3—35



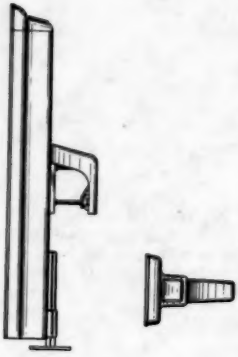
288,032
SKI AND SKI POLE CARRIER
Michael D. Gainey, 2620 Del Monte La., Reno, Nev. 89511
Filed Jun. 15, 1984, Ser. No. 621,015
Term of patent 14 years
U.S. Cl. D3—36

288,033
PORTFOLIO
Carmen M. Lodico, New York, and Lloyd Elliot, Riverdale, both of N.Y., assignors to Greenleaf Lodico Ltd., New York, N.Y.
Filed May 7, 1984, Ser. No. 607,612
Term of patent 14 years
U.S. Cl. D3—71

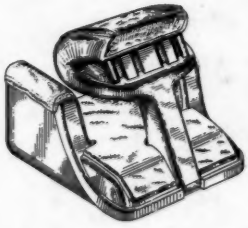


288,034
FOOT HYGIENE BRUSH
Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.
Filed Apr. 5, 1985, Ser. No. 720,429
Term of patent 14 years
U.S. Cl. D4—120

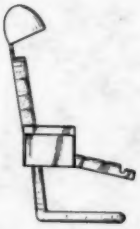
288,035
TELESCOPING TIE RACK HOUSING
Fred Hollinger, Kings Park, and Paul Ross, Pleasantville, both of N.Y., assignors to E & B Giftware, Inc., Mount Vernon, N.Y.
Filed Mar. 21, 1984, Ser. No. 592,413
Claims priority, application United Kingdom, Sep. 21, 1983, 1015243
Term of patent 14 years
U.S. Cl. D6—324



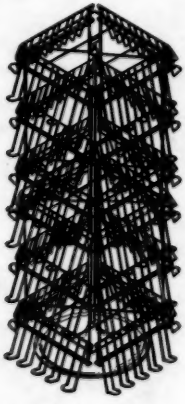
288,036
CHILD'S CAR SEAT
Edward M. Johnson, Jr., 814 Oxford Ave., Matteson, Ill. 60463
Filed Jul. 3, 1984, Ser. No. 627,391
Term of patent 14 years
U.S. Cl. D6—333



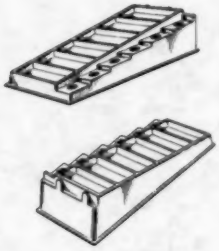
288,037
CHAIR FOR USE BY A BEAUTICIAN
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Dec. 23, 1983, Ser. No. 564,697
Term of patent 14 years
U.S. Cl. D6—335



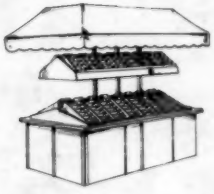
288,038
VIDEO CASSETTE DISPLAY RACK
Verne R. Henning, 3248 Owasso Heights Rd., Shoreview, Minn. 55112
Filed Sep. 6, 1984, Ser. No. 647,689
Term of patent 14 years
U.S. Cl. D6—458



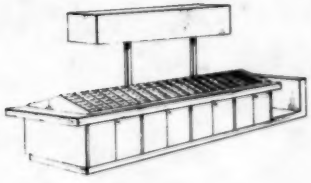
288,039
DISPLAY TRAY
Pierre LeBlanc, Weston, Canada, assignor to Pierre LeBlanc Consulting Services, Ltd., Mississauga, Canada
Filed Apr. 3, 1984, Ser. No. 596,316
Term of patent 14 years
U.S. Cl. D6—468



288,040
DISPLAY STAND
Pierre LeBlanc, Weston, Canada, assignor to Pierre LeBlanc Consulting Services, Ltd., Mississauga, Canada
Filed May 29, 1984, Ser. No. 614,756
Term of patent 14 years
U.S. Cl. D6—473

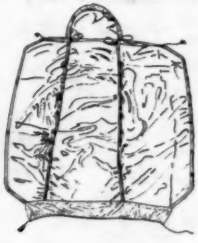


288,041
DISPLAY STAND
Pierre LeBlanc, Weston, Canada, assignor to Pierre LeBlanc Consulting Services, Ltd., Mississauga, Canada
Filed May 29, 1984, Ser. No. 614,757
Term of patent 14 years
U.S. Cl. D6—473



288,042
RECEPTACLE OR SIMILAR ARTICLE
Phyllis M. Breeze, Cotter; Jay T. Wescoat, Mountain Home; Jean Wilkinson, Batesville, all of Ark., and Anita G. Grugett, Memphis, Tenn., assignors to White River Industries, Inc., Cotter, Ark.
Filed Aug. 10, 1984, Ser. No. 639,821
Term of patent 14 years
U.S. Cl. D6—563

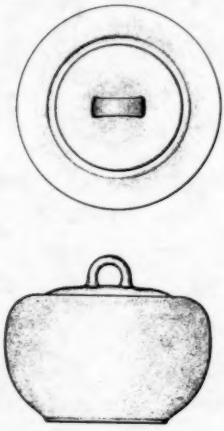
288,043
SURVIVAL BLANKET
Peder Gjendemsjo, Tomrefjord, Norway, assignor to A/S More Tekstilfabrikk, Gascid, Norway
Filed Jun. 4, 1984, Ser. No. 617,037
Term of patent 14 years
U.S. Cl. D6—603



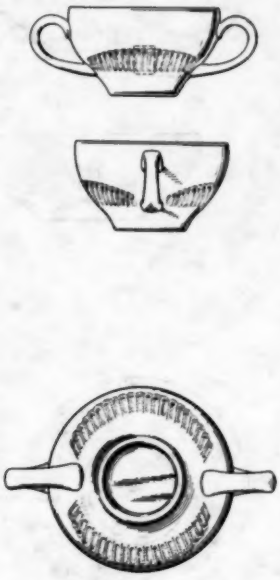
288,044
FOOD CUP
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 13, 1984, Ser. No. 600,094
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—6

288,045
TEA CUP OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 13, 1984, Ser. No. 600,090
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—9

288,046
SUGAR BOWL
Robin Levien, London, England, assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 28, 1983, Ser. No. 566,221
Term of patent 14 years
U.S. Cl. D7—17



288,047
SOUP BOWL OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Apr. 13, 1984, Ser. No. 600,088
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—20



288,048

SOUP BOWL OR SIMILAR ARTICLE

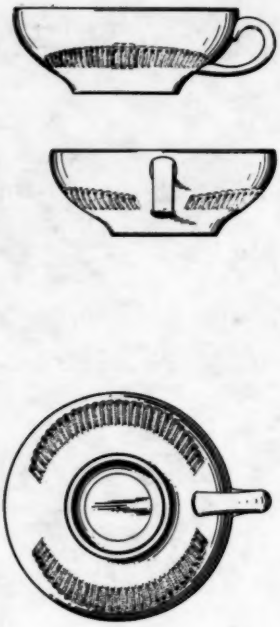
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,089

The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—20



288,049

SOUP BOWL OR SIMILAR ARTICLE

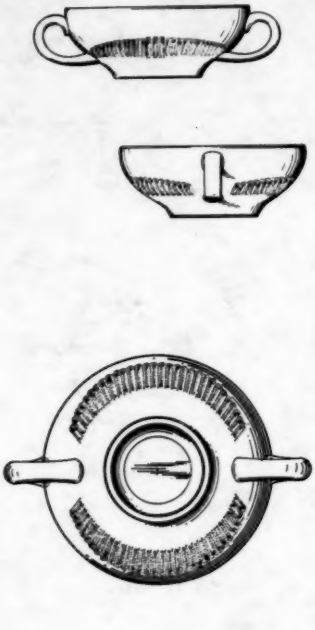
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,291

The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—20



288,050

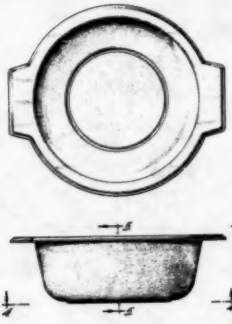
FOOD BOWL

Charles E. Fox, Haddonfield, N.J., and Frank H. Terwilliger, Swarthmore, Pa., assignors to Campbell Soup Company, Camden, N.J.

Filed Sep. 4, 1984, Ser. No. 646,530

Term of patent 14 years

U.S. Cl. D7—20



288,051

SOUP BOWL OR SIMILAR ARTICLE

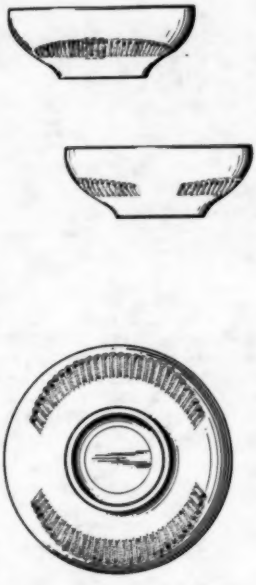
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,292

The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—28



288,052

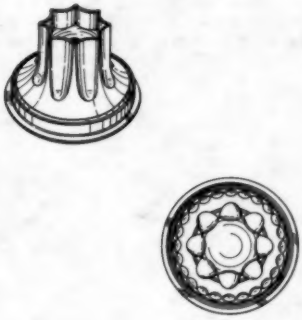
GELATIN MOLD OR THE LIKE

Robert H. C. M. Daenen, Blakmeers, and Pieter K. J. DeCoster, Priester, both of Belgium, assignors to Dart Industries Inc., Del.

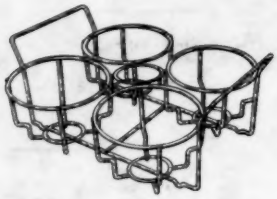
Filed Aug. 9, 1983, Ser. No. 521,783

Term of patent 14 years

U.S. Cl. D7—43



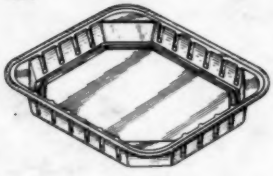
288,053
SALADWARE CADDY
Dale T. Maza, Box 87A, Rte. #1, Stephenson, Va. 22656; Larry S. Hawkins, Rte. 1, Box 114H, Winchester, Va. 22601, and George B. Luhman, Jr., N70 W. 26423, Thousand Oaks, Sussex, Wis. 53089
Filed May 15, 1984, Ser. No. 610,516
Term of patent 14 years
U.S. Cl. D7—58



288,054
DESK ATTACHABLE CUP HOLDER
Sheila Schulte, 16444 Cornuta, Apt. 6, and Antonio DiMatteo, 16310 Conuta, Apt. 125, both of, Bellflower, Calif. 90706
Filed Jul. 2, 1984, Ser. No. 627,213
Term of patent 14 years
U.S. Cl. D7—70

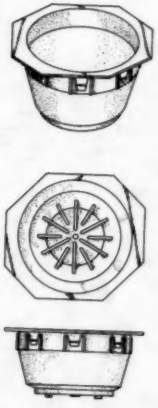
FIG.

288,055
ROASTER
Frederick D. Alexander, Arlington Heights, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Apr. 9, 1984, Ser. No. 598,193
The portion of the term of this patent subsequent to Jan. 20, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—354

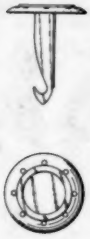


288,056
OUTER FRONT FACE OF A UTENSIL KNOB
Stefan A. Bloom, 12 Fay Dr., East Hanover, N.J. 07936
Filed Sep. 19, 1983, Ser. No. 533,404
Term of patent 14 years
U.S. Cl. D7—393

288,057
DRIP COFFEEMAKER BREWING BASKET
Joseph P. Webster, St. Charles, Mo., assignor to Newco Enterprises, Inc., St. Charles, Mo.
Filed Jun. 11, 1984, Ser. No. 619,376
Term of patent 14 years
U.S. Cl. D7—400

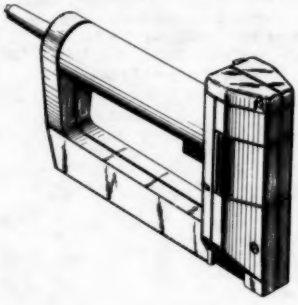


288,058
LAWN SPRINKLER LOCATOR
Randell D. Ball, 1141 Elk, Yukon, Okla. 73099
Filed May 17, 1984, Ser. No. 611,218
Term of patent 14 years
U.S. Cl. D8—1

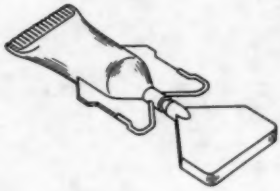


288,059
OIL CAN OPENER WITH INTEGRAL FUNNEL
Tyler C. Fling, 715 Spring Dr., Walnut Creek, Calif. 94598
Filed Feb. 21, 1984, Ser. No. 581,567
Term of patent 14 years
U.S. Cl. D8—34

288,060
ELECTRIC FLUSH STAPLER
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.
Filed Apr. 2, 1984, Ser. No. 595,604
Term of patent 14 years
U.S. Cl. D8—69

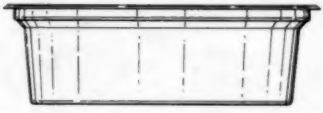


288,061
DISPENSING TUBE FOR LIQUID OR PASTE-LIKE SUBSTANCES
Helge S. Bek, Nodebo, and Stig Jorgensen, Hillerød, both of Denmark, assignors to Pharmacia AS, Hillerød, Denmark
Filed Jul. 16, 1984, Ser. No. 630,983
Claims priority, application Denmark, Jan. 17, 1984, 48/84
Term of patent 14 years
U.S. Cl. D9—302

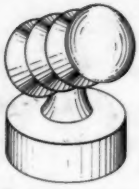


288,062
COMBINED GREETING CARD AND CANDY PACKAGE
David B. Aronson, 165 Mansfield St., Sharon, Mass. 02067
Filed Sep. 10, 1984, Ser. No. 649,056
Term of patent 14 years
U.S. Cl. D9—332

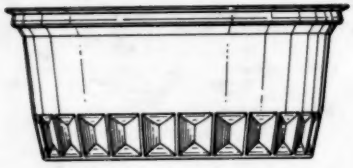
288,063
PACKAGING CONTAINER
Frank S. Tyler, Kent, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jul. 19, 1984, Ser. No. 632,184
Claims priority, application United Kingdom, Jan. 24, 1984, 1017502
Term of patent 14 years
U.S. Cl. D9—425



288,064
COMBINED BULB AND CAP FOR A DROPPER APPLICATOR
James F. Gager, New York, N.Y., assignor to Estee Lauder Inc., New York, N.Y.
Filed Dec. 23, 1983, Ser. No. 565,154
Term of patent 14 years
U.S. Cl. D9—436



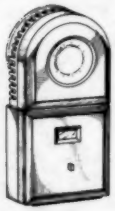
288,065
PACKAGING CONTAINER
Frank S. Tyler, Kent, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jul. 19, 1984, Ser. No. 632,183
Claims priority, application United Kingdom, Jan. 24, 1984, 1017503
Term of patent 14 years
U.S. Cl. D9—429



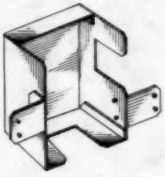
288,066
COMBINED WATCH AND BRACELET
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-Sur-Glane, Switzerland
Filed Oct. 13, 1983, Ser. No. 541,705
Claims priority, application France, Apr. 14, 1983, 831 388
Term of patent 14 years
U.S. Cl. D10—32

288,067
WRIST WATCH
Eric Bonnet, La Chaux-De-Fonds, Switzerland, assignor to Jean Lassale S.A., Geneva, Switzerland
Filed Jul. 7, 1983, Ser. No. 511,795
Claims priority, application Hague, Jan. 7, 1983, 72914
Term of patent 14 years
U.S. Cl. D10—39

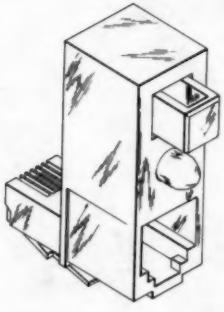
288,068
AUTOMATIC THERMOSTAT CONTROL
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurors, Ill.
Filed Jun. 20, 1984, Ser. No. 622,871
Term of patent 14 years
U.S. Cl. D10—50



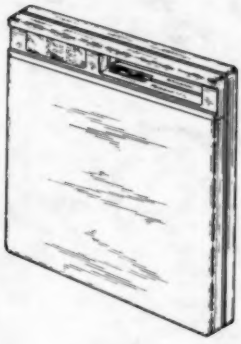
288,069
SECURITY BOX FOR A WATER HEATER THERMOSTAT
Robert W. Fair, 600 W. "E" St., #10, Colton, Calif. 92324, and Robert A. Fair, 915 Scenic Dr., San Bernardino, Calif. 92408
Filed May 16, 1983, Ser. No. 494,718
Term of patent 14 years
U.S. Cl. D10—60



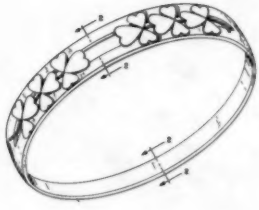
288,070
TELEPHONE LINE STATUS INDICATOR
Woodrow W. Williams, Stamford, Conn., assignor to GTE Service Corporation, Danvers, Mass.
Filed Jul. 5, 1984, Ser. No. 627,934
Term of patent 14 years
U.S. Cl. D10—78



288,071
SCALE
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Aug. 27, 1984, Ser. No. 644,591
Term of patent 14 years
U.S. Cl. D10—92

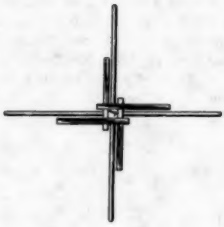


288,072
RING
Dorothy Winters, Rte. 1, Box 298A, Gate City, Va. 24251
Filed Apr. 19, 1984, Ser. No. 602,072
Term of patent 14 years
U.S. Cl. D11—33



288,073
ARTIFICIAL POTTED TREE
John S. Jakubek, P.O. Box 16069, Pittsburgh, Pa. 15220
Filed Jun. 28, 1984, Ser. No. 625,834
Term of patent 14 years
U.S. Cl. D11—118

288,074
CHRISTMAS TREE
Robert M. Vogel, 414 Frances St., Key West, Fla. 33040
Filed Jul. 23, 1984, Ser. No. 633,651
Term of patent 14 years
U.S. Cl. D11—118



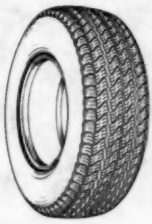
288,075
TENNIS TROPHY
Freddy T. Lee, 2008 SW. 17th St., Boynton Beach, Fla. 33435
Filed Aug. 15, 1984, Ser. No. 641,063
Term of patent 14 years
U.S. Cl. D11—160

288,076
HAND STATUE OR SIMILAR ARTICLE
Milford R. Wheeler, 3340 Jonakin Dr., Nashville, Tenn. 37211
Filed May 11, 1984, Ser. No. 609,198
Term of patent 14 years
U.S. Cl. D11—160

288,077
MOTORCYCLE TIRE
Toru Osawa, and Hideaki Nishio, both of Saitama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,445
Claims priority, application Japan, Jun. 1, 1984, 59-22298
Term of patent 14 years
U.S. Cl. D12—142

288,078
AUTOMOBILE TIRE
Hirotsugu Hasegawa, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 16, 1984, Ser. No. 610,807
Claims priority, application Japan, Nov. 24, 1983, 58-51106
Term of patent 14 years
U.S. Cl. D12—146

288,079
AUTOMOBILE TIRE
Kenji Takehara, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Jul. 10, 1984, Ser. No. 629,470
Claims priority, application Japan, Feb. 10, 1984, 59-4621
Term of patent 14 years
U.S. Cl. D12—146



288,080
AUTOMOBILE TIRE
Toshio Koyama, Fukushima, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 17, 1984, Ser. No. 611,079
Claims priority, application Japan, Mar. 28, 1984, 59-12269
Term of patent 14 years
U.S. Cl. D12—146

288,081
AUTOMOBILE TIRE
Tetsuhito Tsukagoshi, Tokyo; Tamotsu Matsunuma, and Shigeo Makino, both of Saitama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 10, 1984, Ser. No. 680,027
Claims priority, application Japan, Jul. 31, 1984, 59-32060
Term of patent 14 years
U.S. Cl. D12—147

288,082
AUTOMOBILE TIRE
Kozaburo Nakaseko, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 11, 1984, Ser. No. 649,380
Claims priority, application Japan, Jul. 2, 1984, 59-27520
Term of patent 14 years
U.S. Cl. D12—147

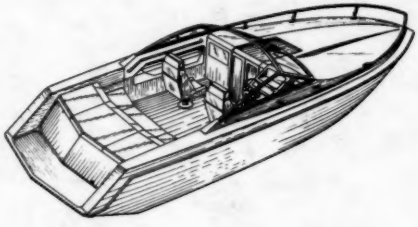
288,083
AUTOMOBILE TIRE
Akihiro Takeuchi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 17, 1984, Ser. No. 611,078
Claims priority, application Japan, Mar. 28, 1984, 59-12266
Term of patent 14 years
U.S. Cl. D12—148

288,084
AUTOMOBILE TIRE
Kenji Hatakenaka, Hyogo, Japan, assignor to Sumitomo Rubber Industries Ltd., Kobe, Japan
Filed May 16, 1984, Ser. No. 610,806
Claims priority, application Japan, Mar. 28, 1984, 59-12267
Term of patent 14 years
U.S. Cl. D12—151

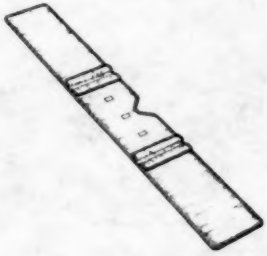
288,085
AUTOMOBILE GRILL
Koji Nagano, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 21, 1984, Ser. No. 642,892
Term of patent 14 years
U.S. Cl. D12—163

288,086
WHEEL
Björn E. A. Envall, Vänersborg, and Ralph Jonsson, Trollhättan, both of Sweden, assignors to Saab-Scania Aktiebolag, Trollhatten, Sweden
Filed Apr. 24, 1984, Ser. No. 603,952
Claims priority, application Sweden, Oct. 26, 1983, 832771
Term of patent 14 years
U.S. Cl. D12—209

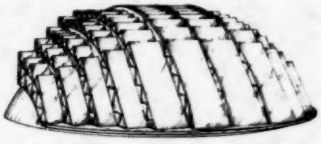
288,087
BOAT
Allan B. Hegg; Lloyd S. Makowski, both of Manistee, and James S. Phares, Farmington Hills, all of Mich., assignors to Century Boat Company, Manistee, Mich.
Filed Sep. 18, 1984, Ser. No. 651,799
Term of patent 14 years
U.S. Cl. D12—315



288,088
CARRYING POUCH FOR A CATAMARAN SAILBOAT
Gary Griffin, 316 Anderson, Hurst, Tex. 76053, and Richard Griffin, 1502 Woodridge, Euless, Tex. 76040
Filed Nov. 5, 1984, Ser. No. 668,551
Term of patent 14 years
U.S. Cl. D12—317

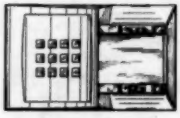


288,089
SOLAR VOLTAIC GENERATOR
Richard T. Headrick, 5200 Irvine Blvd., Space #24, Irvine, Calif. 92714
Filed Oct. 11, 1983, Ser. No. 540,448
Term of patent 14 years
U.S. Cl. D13—3

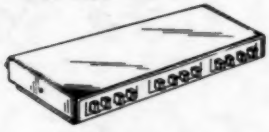


288,090
FRAME FOR AN AUDIO SPEAKER
Larry E. Lewis, 1630 S. 1400 E., Salt Lake City, Utah 84105, and Jerry D. Senninger, 2251 E. 6720 S., Salt Lake City, Utah 84121
Filed May 8, 1984, Ser. No. 608,143
Term of patent 14 years
U.S. Cl. D14—33

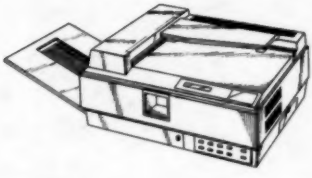
288,091
TELEPHONE SET
Kenneth Reichenstein, Floral Park, N.Y., assignor to Webcor Electronics, Inc., Long Island, N.Y.
Filed Jul. 28, 1983, Ser. No. 518,090
Term of patent 14 years
U.S. Cl. D14—53



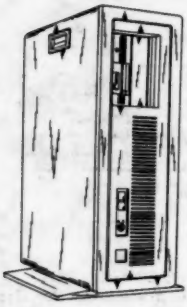
288,092
VIDEO SELECTOR
Bruce R. Towell, Sea Cliff, and Arthur Rey, Oyster Bay, both of N.Y., assignors to BP Electronics, Inc., Hauppauge, N.Y.
Filed Jun. 4, 1984, Ser. No. 616,932
Term of patent 14 years
U.S. Cl. D14—84



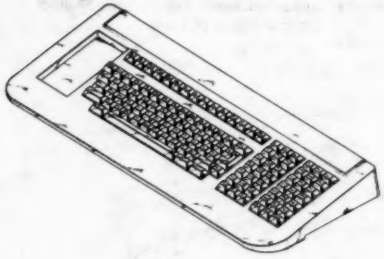
288,093
FACSIMILE TRANSCEIVER
Yoshiyuki Fujiyama; Hidemi Watanabe; Toshihiro Kumano; Minoru Terakado, and Yoshitatsu Okiyama, all of Nagano, Japan, assignors to Matsushita Graphic Communications Systems Inc., Japan
Filed Jun. 11, 1984, Ser. No. 619,241
Claims priority, application Japan, Feb. 6, 1984, 59-4015
Term of patent 14 years
U.S. Cl. D14—94



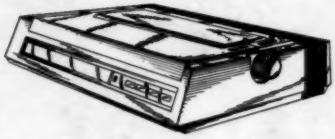
288,094
FLOOR STANDING PERSONAL COMPUTER
Myron F. Davis; Fred E. Goetz; James C. Harris, all of Boca Raton; Steven E. Howell, Lantana; Willis Y. Jordan, III, Boca Raton; Robert W. Lloyd, West Palm Beach; Randall W. Martin, Boca Raton; David F. O'Connor, Delray Beach, and Frederick Parker, Jr., South Palm Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 15, 1984, Ser. No. 619,415
Term of patent 14 years
U.S. Cl. D14—100



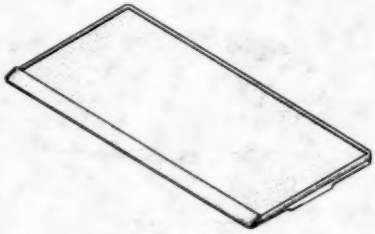
288,095
KEYBOARD
Lewis W. Bennett, Nashua, N.H., assignor to Itek Graphix Corp., Waltham, Mass.
Filed Apr. 18, 1984, Ser. No. 601,408
Term of patent 14 years
U.S. Cl. D14—100



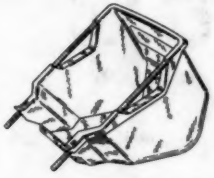
288,096
PRINTER
Shigemasa Kato, Zama, and Sanae Takada, Chofu, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1984, Ser. No. 652,768
Claims priority, application Japan, Mar. 28, 1984, 58-12048
Term of patent 14 years
U.S. Cl. D14—111



288,097
KEYBOARD SUPPORT
Mark A. Harter, Hamilton, and Raoul J. Schoumaker, Wyoming, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 13, 1984, Ser. No. 630,807
Term of patent 14 years
U.S. Cl. D14—114



288,098
COLLECTOR BOX FOR LAWNMOWERS, LAWNRAKERS, OR THE LIKE
Alan Trelford, Surrey, and Laurence T. Cunningham, Stockton-on-Tees, both of England, assignors to Black & Decker Inc., Newark, Del.
Filed Oct. 3, 1984, Ser. No. 657,235
Claims priority, application United Kingdom, Apr. 13, 1984, 1019087
Term of patent 14 years
U.S. Cl. D15—17



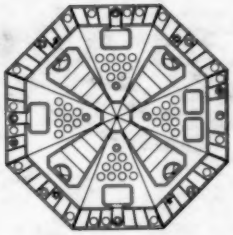
288,099
WORK PIECE SUPPORT
Roger E. Abitz, 41844 Sunnydale La., Northville, Mich. 48167
Filed Dec. 7, 1984, Ser. No. 679,542
Term of patent 14 years
U.S. Cl. D15—140

288,100
TYPE FACE
Karl Gerstner, Leonhardsgraben 52, CH-4061 Basel, Switzerland
Filed Aug. 7, 1984, Ser. No. 638,590
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, URA-TY 7/84
Term of patent 14 years
U.S. Cl. D18—24

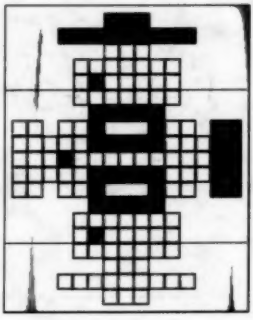
Aa Bb Cc
Dd Ee Ff Gg Hh
Ii Jj Kk Ll Mm
Nn Oo Pp Qq Rr
Ss Tt Uu Vv Ww
Xx Yy Zz

288,101
ILLUMINATED SIGN
William A. Rohrer, III, Ann Arbor, Mich., assignor to Versalite, Inc., Ann Arbor, Mich.
Filed Feb. 24, 1984, Ser. No. 583,414
Term of patent 14 years
U.S. Cl. D20—10

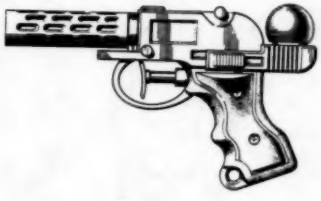
288,102
GAME BOARD
Alfred J. Galea, Toorak, and Stephen Chapman, Doncaster, both of Australia, assignors to John Gale Pty, Ltd., Australia
Filed Sep. 4, 1984, Ser. No. 646,542
Claims priority, application Australia, Apr. 12, 1984, 7153/84
Term of patent 14 years
U.S. Cl. D21—33



288,103
GAMEBOARD
Kenneth J. Ray, 5217 Sherbrooke. West, Appt. 60, Montreal, Quebec, Canada (H4A 1T6)
Filed Aug. 27, 1984, Ser. No. 644,576
Term of patent 14 years
U.S. Cl. D21—34



288,104
TOY GUN
Francis M. L. Barthropp, 4371 Marine Dr., West Vancouver, British Columbia, Canada (V7V 1P3)
Filed Aug. 15, 1984, Ser. No. 641,007
Term of patent 14 years
U.S. Cl. D21—147



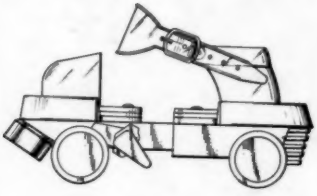
288,105
COMBINED DOLL AND HOLDER
John Hollingshead, 1213 W. Third St., Sioux City, Iowa 51102, and Anna Barnes, R.R. 1, Sioux City, Iowa 51108
Filed Jun. 1, 1984, Ser. No. 616,231
Term of patent 14 years
U.S. Cl. D21—167

288,106
STUFFED TOY BEE FIGURE
James B. Dotson, Jr., 1170 Poplar St., Alcoa, Tenn. 37701
Filed Apr. 24, 1984, Ser. No. 603,518
Term of patent 14 years
U.S. Cl. D21—185

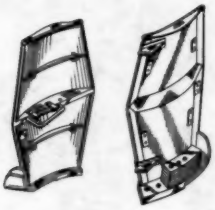
288,107
EYE FOR FIGURE TOY
Gentry L. Akens, II, 25404 Pine Creek La., Wilmington, Calif. 90744, and H. Joe Ware, 6410 Rio Linda, Rancho Palos Verdes, Calif. 90274
Filed Mar. 21, 1984, Ser. No. 592,301
Term of patent 14 years
U.S. Cl. D21—189

288,108
PHYSICAL EXERCISER
Hiroshi Hata, Osaka, Japan, assignor to Hata Sporting Goods Industries Limited, Osaka, Japan
Filed Jun. 19, 1984, Ser. No. 622,190
Term of patent 14 years
U.S. Cl. D21—198

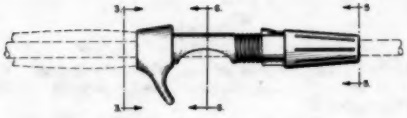
288,109
ROLLER SKATE
Reuben B. Klamer, Los Angeles, Calif., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 1, 1983, Ser. No. 547,647
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—226



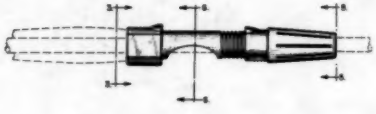
288,110
OTTER BOARD
Koichi Tozaki, Tokyo, Japan, assignor to Nichimo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 11, 1984, Ser. No. 649,519
Term of patent 14 years
U.S. Cl. D22—135



288,111
HANDLE BODY FOR A FISHING ROD
Casey J. Childre, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Mar. 12, 1984, Ser. No. 588,523
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—142

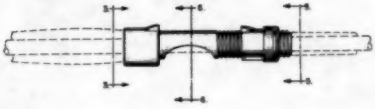


288,112
HANDLE BODY FOR A FISHING ROD
Casey J. Childre, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Mar. 12, 1984, Ser. No. 588,525
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—142

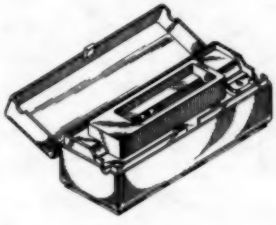


288,113
HANDLE BODY FOR A FISHING ROD
Casey J. Childre, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Mar. 12, 1984, Ser. No. 588,526
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—142

288,114
HANDLE BODY FOR A FISHING ROD
Casey J. Childre, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Mar. 12, 1984, Ser. No. 588,527
The portion of the term of this patent subsequent to Feb. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—142

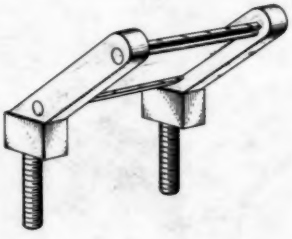


288,115
PORTABLE WATER PURIFIER UNIT
Calvin W. McCausland, Springville, and Louis A. Palombo, Spanish Fork, both of Utah, assignors to Nature's Sunshine Products, Inc., Spanish Fork, Utah
Filed Jun. 20, 1984, Ser. No. 622,717
Term of patent 14 years
U.S. Cl. D23—3

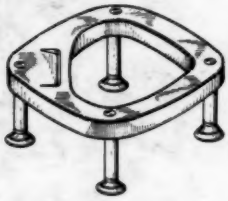


288,116
YOKE FOR A SPRINKLER
William R. McLennan, Easton, Pa., and Robert Rung, Hopatcong, N.J., assignors to Victaulic Company of America, Easton, Pa.
Filed Jun. 12, 1984, Ser. No. 619,806
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—7

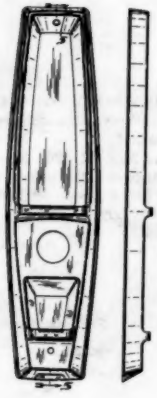
288,117
BATHTUB SPOUT
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Jul. 19, 1984, Ser. No. 632,177
Term of patent 14 years
U.S. Cl. D23—32



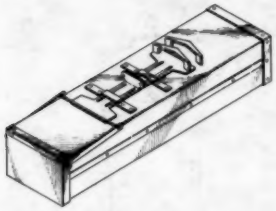
288,118
BATH RING FOR INFANTS
Richard Boucher, Fitchburg, Mass., assignor to Sanitoy, Inc., Fitchburg, Mass.
Filed Jun. 11, 1984, Ser. No. 619,114
Term of patent 14 years
U.S. Cl. D23—69



288,119
COVER FOR A BATHTUB PLUMBING UNIT
Charles P. Hill, Indianapolis, and Anthony G. Spangler, Westfield, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Jun. 15, 1983, Ser. No. 504,664
Term of patent 14 years
U.S. Cl. D23—69

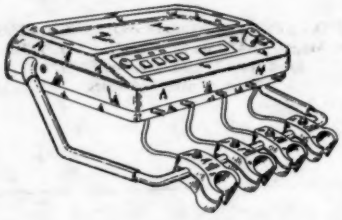


288,120
FIREPLACE AND WOOD STOVE ASH REMOVER
Gene C. Carter, Box 730, Morgan, Utah 84050
Filed Feb. 19, 1985, Ser. No. 702,955
Term of patent 14 years
U.S. Cl. D23—131



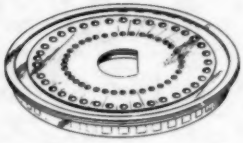
288,121
VENTILATOR FOR CONTAINER
Masaki Takahashi, Kawasaki, and Shigeo Mizuno, Yamato, both of Japan, assignors to Nishiyama Corporation, Japan
Filed May 25, 1984, Ser. No. 614,340
Term of patent 14 years
U.S. Cl. D23—139

288,122
COMBINED CONTROL UNIT AND HOLDER FOR DENTAL EQUIPMENT
George McGaha, Charlotte; Dan Truette, Pineville, both of N.C.; Ned Landan, Westport, Conn., and Bill Hardin, Charlotte, N.C., assignors to Pelton & Crane Company, Charlotte, N.C.
Filed Dec. 19, 1983, Ser. No. 562,689
Term of patent 14 years
U.S. Cl. D24—5

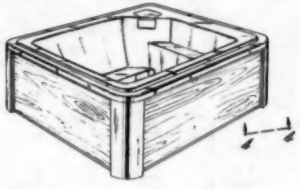


288,123
DENTAL MATERIAL DISPENSER
Richard E. Welsh, Milford, Del., assignor to Dentsply Research & Development Corp., Milford, Del.
Filed Jun. 6, 1984, Ser. No. 616,671
Term of patent 14 years
U.S. Cl. D24—10

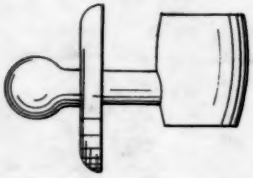
288,124
CENTRIFUGAL ANALYZER ROTOR
Romas A. Brickus, Brookline, Mass.; Thomas O. Tiffany, Spokane, Wash., and Hamid Keramaty, Lexington, Mass., assignors to Fisher Scientific Company, Pittsburgh, Pa.
Filed May 31, 1984, Ser. No. 615,626
Term of patent 14 years
U.S. Cl. D24—31



288,125
SPA
Jonathan Watkins, San Marcos, Calif., assignor to Watkins Manufacturing Co., Carlsbad, Calif.
Filed Apr. 25, 1984, Ser. No. 603,721
Term of patent 14 years
U.S. Cl. D24—38



288,126
INFANT PACIFIER
Jacqueline Haupt, P.O. Box 528, LaCygne, Kans. 66040
Filed Dec. 19, 1983, Ser. No. 563,212
Term of patent 14 years
U.S. Cl. D24—45



288,127
BABY BOTTLE OR SIMILAR ARTICLE
William Simmons, 8302 Gumwood Cir., Westminster, Calif. 92683
Filed Feb. 17, 1984, Ser. No. 581,310
Term of patent 14 years
U.S. Cl. D24—47

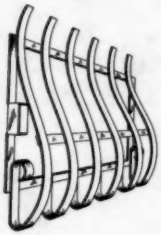
288,128
INFANT NURSER OR SIMILAR ARTICLE
Leonard A. White, Gurnee, and James L. Cabernoch, Cary, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 12, 1984, Ser. No. 599,424
Term of patent 14 years
U.S. Cl. D24—47

288,129
SURGICAL SUCTION COLLECTOR
Beverly W. Taylor, Hermann, Mo., assignor to Blanke Plastic Company, Hermann, Mo.
Filed Feb. 15, 1984, Ser. No. 580,562
Term of patent 14 years
U.S. Cl. D24—56

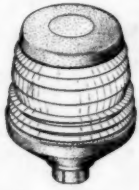
288,130
COMBINED VIAL AND CLOSURE
Mark E. Larkin, Lindenhurst, and Edward S. Tripp, Park City, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 11, 1984, Ser. No. 619,520
Term of patent 14 years
U.S. Cl. D24—56

288,131
INSULATED PANEL FOR ROLLING GATES
Sebastian Magro, 78-47 75th St., Glendale, N.Y. 11385
Filed Nov. 2, 1983, Ser. No. 547,779
Term of patent 14 years
U.S. Cl. D25—49

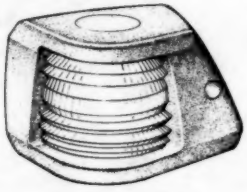
288,132
SECURITY GRILLE
Milton L. Howard, 21 Banbury La., Bloomfield, Conn. 06002
Filed Oct. 24, 1983, Ser. No. 544,838
Term of patent 14 years
U.S. Cl. D25—53



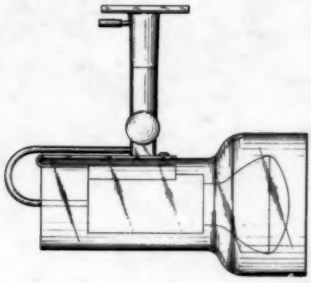
288,133
NAVIGATION LIGHT
Rudiger Schmidt, Bremen, Fed. Rep. of Germany, assignor to Ahlemann & Schlatter GmbH, Fed. Rep. of Germany
Filed Nov. 15, 1984, Ser. No. 671,674
Term of patent 14 years
U.S. Cl. D26—28



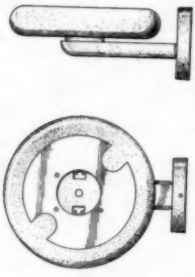
288,134
NAVIGATION LIGHT
Rudiger Schmidt, Bremen, Fed. Rep. of Germany, assignor to Ahlemann & Schlatter GmbH, Fed. Rep. of Germany
Filed Nov. 15, 1984, Ser. No. 671,743
Term of patent 14 years
U.S. Cl. D26—28



288,135
LIGHTING FIXTURE
Anthony Donato, Westfield, N.J., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed Aug. 10, 1984, Ser. No. 639,599
Term of patent 14 years
U.S. Cl. D26—63



288,136
WALL LAMP
Murray C. Pfister, San Francisco, Calif., assignor to Boyd Lighting Company, San Francisco, Calif.
Filed May 16, 1984, Ser. No. 611,023
Term of patent 14 years
U.S. Cl. D26—87



288,137
COMBINED AUTOMOBILE TAILLIGHT LENS AND COVER
Hiroshi Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 13, 1984, Ser. No. 650,113
Term of patent 14 years
U.S. Cl. D26—120

288,138
TUB SCRUBBING DEVICE
Brenner E. Smith, Greenfield, Mass., assignor to J. H. Smith & Company, Greenfield, Mass.
Filed Jan. 14, 1985, Ser. No. 691,146
Term of patent 14 years
U.S. Cl. D32—42

288,139
COMBINED BUCKET AND DISPENSING LID
Joost van Berne, Dongen; Gerardus J. van der Vlies, Heusden, both of Netherlands, and John A. Howard, Bedford, England, assignors to Lever Brothers Company, New York, N.Y.
Filed Mar. 9, 1984, Ser. No. 587,747
Claims priority, application United Kingdom, Sep. 9, 1983, 1015036
Term of patent 14 years
U.S. Cl. D32—53

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF FEBRUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.T.B. S.p.A.: *See—*
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AB A.K. Eriksson: *See—*
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AB Volvo: *See—*
Borjesson, Tore L., 4,640,399, Cl. 192-70.250.

Abbes, Claude; Rouaud, Christian; Valla, Jean; Forges, Robert; and de Villepoix, Raymond, to Commissariat a l'Energie Atomique. Tight connection device. 4,640,530, Cl. 285-18.000.

Abbott Laboratories: *See—*
Faubl, Hermann; and Stein, Robert G., 4,640,910, Cl. 514-29.000.

Abe, Hiroki: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.

Abel, Kent W.: *See—*
Ales, Thomas M.; Strohbeen, David T.; Damico, Joyce A.; Van Gompel, Paul T.; and Abel, Kent W., 4,639,949, Cl. 2-400.000.

Abo, Toshimi; and Hata, Yoshitaka, to Nissan Motor Company, Limited. System and method for controliing intake air flow for an internal combustion engine. 4,640,243, Cl. 123-399.000.

Abura, Yoshinori; Tsuji, Eiji; Okuyama, Kenji; and Ochi, Shuhei, to Matsushita Electric Works, Ltd. Battery powered electric hair curler. 4,641,010, Cl. 219-222.000.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Container having automatic doors and for accommodating data storage media. 4,640,415, Cl. 206-387.000.

Ackley, Donald E., to RCA Corporation. Phase-locked semiconductor laser array with integral phase shifters. 4,641,311, Cl. 372-18.000.

Adamantech, Inc.: *See—*
Tamborski, Christ; and Clark, Leland C., Jr., 4,640,833, Cl. 424-5.000.

Adams, James H.; Burgess, Jerry L.; and Wagers, William C., to Combustion Engineering, Inc. Segmented electrode collecting panel assembly. 4,640,695, Cl. 55-130.000.

Adams, John T.; and Bohan, John E., Jr., to Honeywell Inc. Printed wiring board means with isolated voltage source means. 4,641,043, Cl. 307-117.000.

Adams-Russell Company, Inc.: *See—*
Smith, Kenneth L., 4,641,110, Cl. 333-12.000.

Adams, Sherman C., to Alcan Aluminum Corporation. Roller assembly with stabilizer elements for sliding panels. 4,639,970, Cl. 16-90.000.

Addeo, Eric J., to Bell Communications Research, Inc. Method for improving the reliability of data transmission over Rayleigh fading channels. 4,641,318, Cl. 375-38.000.

Adell, Robert, to U.S. Product Development Company. Hip belt. 4,639,948, Cl. 2-338.000.

Advanced Color Technology Inc: *See—*
Zoltan, Steven I., 4,641,155, Cl. 346-140.00R.

Advanced Micro Devices, Inc.: *See—*
Brown, Candice H., 4,640,010, Cl. 29-832.000.
Laugesen, Ronald C.; and Venkitakrishnan, Padmanabha I., 4,641,247, Cl. 364-490.000.

AE PLC: *See—*
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Aequitron Medical, Inc.: *See—*
Isaacson, Philip O., 4,640,295, Cl. 128-748.000.

Aerospatiale Societe National Industrielle: *See—*
Lecuru, Daniel; and Choffy, Jean-Pierre, 4,640,133, Cl. 73-639.000.

Afghan, Madjid; and Sponselee, Josephus G., to Shell Oil Company. Process for the preparation of silica spheres. 4,640,807, Cl. 264-13.000.

Agan Chemical Manufacturers Ltd.: *See—*
Gabe, Julian; and Makepeace, Richard J., 4,640,705, Cl. 71-93.000.

Agricultural Genetics Company, Limited: *See—*
Boulter, Donald; Gatehouse, Angharad M. R.; Gatehouse, John A.; and Cox, Roger B., 4,640,836, Cl. 424-195.100.

Aguilar, Henry. Rocker-recliner chair. 4,640,546, Cl. 297-260.000.

Ahola, Raimo: *See—*
Myllyla , Risto; Kopola, Harri; Kostamovaara, Juha; and Ahola, Raimo, 4,640,514, Cl. 273-310.000.

Aiba, Masahiko, to Sharp Kabushiki Kaisha. Low noise solenoid drive. 4,641,219, Cl. 361-153.000.

Aikawa, Masaru: *See—*
Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, 4,641,156, Cl. 346-160.000.

Aisaka, Kazuo: *See—*
Cho, Hidetsura; Aisaka, Kazuo; and Emon, Mariko, 4,640,922, Cl. 514-256.000.

Aisin Seiki Kabushiki Kaisha: *See—*
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Nakagawa, Takeo; and Suzuki, Kiyoshi, 4,640,156, Cl. 82-1.00C.
Nakane, Mototaka; and Tanaka, Shizuo, 4,640,400, Cl. 192-70.250.

Aitoh, Sigeru: *See—*
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Ajinomoto Co., Inc.: *See—*
Meguro, Kenjiro; Sagawa, Koichiro; Yokota, Hirofumi; and Takehara, Masahiro, 4,640,943, Cl. 523-200.000.

Akado, Hajime: *See—*
Taki, Yoshihiro; Akado, Hajime; Funae, Keizo; and Inukai, Satoshi, 4,640,779, Cl. 210-493.500.

Akashi, Kichizo: *See—*
Konishi, Yozo; Akashi, Kichizo; Watase, Hideo; and Yoshioka, Tatsuo, 4,641,271, Cl. 364-478.000.

Akazawa, Toshiyuki; Tanaka, Yoshinari; and Okaya, Takuji, to Kuraray Co., Ltd. Laminate structure and production of the same. 4,640,870, Cl. 428-483.000.

Akebono Brake Industry Company, Ltd.: *See—*
Maehara, Toshifumi; and Kurata, Masayuki, 4,640,391, Cl. 188-353.000.

AKG Akustische u. Kino-Gerate GmbH: *See—*
Hartmann, Hans; and Kerschbaum, Ewald, 4,640,382, Cl. 181-175.000.

Akkerman, Neil H.; and Hare, John P., to AVA International Corporation. Kickover tool. 4,640,350, Cl. 166-117.500.

Akoshima, Shigeru: *See—*
Hayashi, Motomu; Nagai, Masayuki; and Akoshima, Shigeru, 4,640,066, Cl. 52-208.000.

Akutsu, Takao: *See—*
Ono, Takahiro; Akutsu, Takao; and Fujiwara, Hideyuki, 4,640,299, Cl. 131-303.000.

Albaugh, Neil P.; and Kane, Gordon R., to Burr-Brown Corporation. Apparatus and method for noise reduction in a linear amplifier. 4,641,105, Cl. 330-9.000.

Albert Bocker GmbH & Co. Kg., Firma: *See—*
Bocker, Albert, 4,640,387, Cl. 182-213.000.

Alcan Aluminum Corporation: *See—*
Adams, Sherman C., 4,639,970, Cl. 16-90.000.

Alcon Laboratories: *See—*
Park, Joonsup; and Falcetta, Joseph J., 4,640,941, Cl. 523-107.000.

Alcon Laboratories, Inc.: *See—*
Falcetta, Joseph J.; and Park, Joonsup, 4,640,965, Cl. 526-242.000.

Ales, Thomas M.; Strohbeen, David T.; Damico, Joyce A.; Van Gompel, Paul T.; and Abel, Kent W., to Kimberly-Clark Corporation. Elastic form-fitting closure constructions for disposable garments. 4,639,949, Cl. 2-400.000.

Alfors, Eugene D., to Honeywell Inc. Lever operated switch with improved lever interchangeability. 4,641,003, Cl. 200-332.000.

All States Inc.: *See—*
Shely, William W.; and Wells, Peter M., 4,640,479, Cl. 248-56.000.

Alle, Narasaiah, to Dow Chemical Company, The. ABS type resin having disperse particles of a rubber exhibiting a high solution viscosity and a method for its preparation. 4,640,959, Cl. 525-316.000.

Allen and Bennett, Inc.: *See—*
Allen, Loy F., 4,640,349, Cl. 166-68.500.

Allen, Kenneth D.: *See—*
Brogdon, James W.; Allen, Kenneth D.; Barton, John S.; and Hicks, Raymond J., 4,640,153, Cl. 74-789.000.

Allen, Loy F., to Allen and Bennett, Inc. Flexible sucker rod unit. 4,640,349, Cl. 166-68.500.

Allied Corporation: *See—*
Eastman, James M., 4,640,093, Cl. 60-39.281.
Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., 4,640,006, Cl. 29-623.100.
Pitel, Ira J., 4,641,232, Cl. 363-71.000.

Almada, Edward M. Metallic seal with interlocking J-shaped lips. 4,640,516, Cl. 277-236.000.

Alnot, Patrick R.; Auerbach, Daniel J.; Brundle, Christopher R.; and Miller, Dolores C., to International Business Machines Corporation. Process for accelerating Pd/Sn seeds for electroless copper plating. 4,640,718, Cl. 134-2.000.

Alperin, Noam: *See—*
Fenster, Paul; Shimoni, Yair; Nissenson, Bilha; and Alperin, Noam, 4,641,352, Cl. 382-6.000.

Alps Electric Co., Ltd.: *See—*
Iwai, Nobuo, 4,641,020, Cl. 250-201.000.
Matsuura, Takanobu; and Yamamoto, Toshiyuki, 4,641,150, Cl. 346-76.0PH.
Nakanowatari, Jun; Machida, Mitsuo; Okamoto, Toshiyuki; and Nakura, Yoshihiro, 4,640,581, Cl. 350-331.00R.
Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, 4,641,211, Cl. 360-97.000.

Shimada, Yutaka; Hatanai, Takashi; Mukasa, Koichi; and Nakashima, Keishi, 4,641,213, Cl. 360-125.000.
Alston, Lawrence E., to Polaroid Corporation. Electronic image scanner and copier system with color matrix image enhancement. 4,641,184, Cl. 358-75.000.
Alston, Lawrence E.; and Freeman, William T., to Polaroid Corporation. Image sensing and processing apparatus and method. 4,641,185, Cl. 358-75.000.
Amada Engineering Service Co., Inc.: *See*—
Koseki, Ryoji, 4,641,314, Cl. 372-65.000.
Amaray International Corporation: *See*—
Northrup, Allan R.; and Tomkinson, John G., 4,640,416, Cl. 206-425.000.
Amemiya, Ikuzo: *See*—
Goto, Hajime; Amemiya, Ikuzo; Nakayama, Masanobu; and Hatano, Yoshinobu, 4,639,988, Cl. 29-25.350.
American Can Company: *See*—
Ossian, William F., 4,640,852, Cl. 428-35.000.
American Cyanamid Company: *See*—
Koroscil, Anthony, 4,640,193, Cl. 102-336.000.
Wissner, Allan; Schaub, Robert E.; and Sum, Phaik E., 4,640,913, Cl. 514-77.000.
American Energy Services, Inc.: *See*—
Ludwig, Frank, 4,640,119, Cl. 73-12.000.
American Hospital Supply Corporation: *See*—
Balding, David P.; Hsu, Li-Chien; and Gordon, Lucas S., 4,640,819, Cl. 422-22.000.
American Manufacturing Company, Inc.: *See*—
Reger, Philip R., 4,641,132, Cl. 340-540.000.
American Standard Inc.: *See*—
Darrow, John O. G., 4,641,045, Cl. 307-350.000.
Ametek, Inc.: *See*—
Simmons, Robert L., Sr.; and Wyant, Clifton M., 4,641,291, Cl. 367-157.000.
AMF Incorporated: *See*—
Speranza, Daniel R., 4,640,511, Cl. 273-49.000.
Amiel, Jacques: *See*—
Heraud, Roger A.; and Amiel, Jacques, 4,640,122, Cl. 73-49.200.
Amling, Friedel: *See*—
Koppers, Manfred; Bohnes, Karlheinz; and Amling, Friedel, 4,640,650, Cl. 405-290.000.
AMP Incorporated: *See*—
Dery, Ronald A.; and Jones, Warren C., 4,640,981, Cl. 174-88.00R.
Dola, Frank P.; Siwinski, Paul P.; and Zwieg, Grover A., 4,640,569, Cl. 339-143.00R.
Lundergan, Robert G.; and McClune, Donald W., 4,640,567, Cl. 339-94.00M.
Matsusaka, Yoshihide, 4,640,566, Cl. 339-91.00R.
Shoemaker, John R., 4,640,562, Cl. 339-17.00F.
Andersen, Henning R.: *See*—
Pless, Peter; and Andersen, Henning R., 4,640,298, Cl. 128-784.000.
Anderson, Doris E.: *See*—
Anderson, Raymond G.; and Anderson, Doris E., 4,640,287, Cl. 128-460.000.
Anderson, Frederick W.: *See*—
Wilson, Monti R.; Hutchison, Victor E.; Bendure, William J.; and Anderson, Frederick W., 4,641,244, Cl. 364-475.000.
Anderson, J. Edward C.; and Osborn, Merritt A., to Bares Group, The. Crimping tool. 4,640,117, Cl. 72-410.000.
Anderson, James E.; and Holmes, Terry L., to Oscar Mayer Foods Corporation. Apparatus for coating materials onto elongated foodstuffs. 4,640,219, Cl. 118-24.000.
Anderson, Raymond G.; and Anderson, Doris E. Releasable fastening means and method for clothing items, particularly caps, brassiers, and nursing brassiers. 4,640,287, Cl. 128-460.000.
Ando, Hideo; and Doi, Akihiko, to Kabushiki Kaisha Toshiba; and Toshiba Automation Equipment Engineering, Ltd. Optical head. 4,641,023, Cl. 250-216.000.
Andus Corp.: *See*—
Ritchie, Ian T., 4,640,860, Cl. 428-143.000.
Annecke, Karl-Heinz; and Bredemeier-Klonki, Volker, to ANT Nachrichtentechnik GmbH. Circuit arrangement for testing a digital circuit. 4,641,306, Cl. 371-25.000.
ANT Nachrichtentechnik GmbH: *See*—
Annecke, Karl-Heinz; and Bredemeier-Klonki, Volker, 4,641,306, Cl. 371-25.000.
Unger, Hans-Georg, 4,640,574, Cl. 350-96.110.
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, to Consiglio Nazionale Delle Ricerche. Thermistor-bolometer and method for the manufacture thereof. 4,640,629, Cl. 374-178.000.
Anzai, Katsuhi: *See*—
Harada, Osamu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsuhi, 4,640,251, Cl. 123-425.000.
Aoi, Shigeru, to Canon Kabushiki Kaisha. Image display device. 4,641,157, Cl. 346-160.000.
Aoyama, Kazunori, to Fuji Photo Film Co., Ltd. Magnetic tape cassette with improved guide roller means. 4,640,473, Cl. 242-197.000.
Apostolos, John T., to Sanders Associates, Inc. Two-dimensional acquisition system using circular array. 4,641,143, Cl. 342-445.000.
Appleman, Robert H., to Westinghouse Electric Corp. Expandable antivibration bar for heat transfer tubes of a pressurized water reactor steam generator. 4,640,342, Cl. 165-69.000.
Appleman, Robert H.: *See*—
Stol, Israel; and Appleman, Robert H., 4,639,992, Cl. 29-157.00R.
Applied Electron Corp.: *See*—
Collins, George J.; Rocca, Jorge J.; and Meyer, Jack D., 4,641,316, Cl. 372-74.000.
Applied Microwave Plasma Concepts, Inc.: *See*—
Dandl, Raphael A., 4,641,060, Cl. 315-111.710.
Arae, Teiji: *See*—
Sumiyoshi, Hiroji; and Arae, Teiji, 4,641,059, Cl. 313-477.00R.
Arai, Yoshinobu: *See*—
Imaki, Katsuhiro; Okegawa, Tadao; and Arai, Yoshinobu, 4,640,931, Cl. 514-510.000.
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, to Toshiba Ceramics Co., Ltd.; and Sumitomo Metal Industries, Ltd. Refractory for continuous casting. 4,640,336, Cl. 164-440.000.
Arakawa, Kohei, to Nikkiso Co., Ltd. Process for preparing fine fibers. 4,640,830, Cl. 423-346.000.
Aratani, Matsuhiko: *See*—
Hashimoto, Masashi; Aratani, Matsuhiko; and Sawada, Kozo, 4,640,915, Cl. 514-210.000.
Archambeault, Bruce R.; and Rancour, David P., to United States of America, Air Force. Optical mark reader. 4,641,358, Cl. 382-68.000.
ARES, Inc.: *See*—
DeHaven, Vernet F.; and Warin, Francis J., 4,640,182, Cl. 89-47.000.
Arimoto, Kazutami: *See*—
Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, 4,641,281, Cl. 365-189.000.
Ariyama, Kenzo; Kurotori, Tsuneo; and Mochizuki, Manabu, to Ricoh Company, Ltd. Apparatus for forming multicolor electrophotographic images through wet-type developing process. 4,640,605, Cl. 355-4.000.
Armco Inc.: *See*—
Gorman, Mark D., 4,640,722, Cl. 148-325.000.
Armstrong World Industries, Inc.: *See*—
Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., 4,640,885, Cl. 430-197.000.
Arney, Donald B. Collapsible liquid container particularly for transportation by helicopter. 4,640,328, Cl. 150-55.000.
Arrow Oil Tools, Inc.: *See*—
Clifton, Ted G.; and Brookey, Robert L., 4,640,351, Cl. 166-127.000.
Asahara, Yoshiyuki: *See*—
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,640,699, Cl. 65-3.150.
Asahi Glass Company, Ltd.: *See*—
Kokubu, Yoshinori; and Moriyasu, Makoto, 4,640,900, Cl. 501-67.000.
Oyama, Takuji; and Mizuhashi, Mamoru, 4,640,867, Cl. 428-432.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Takizawa, Morio, 4,640,579, Cl. 350-255.000.
Asai, Eiichi; Tanaka, Hiroshi; and Higashi, Nobuaki, to Fuji Photo Film Co., Ltd. Gradation correction curve creating method and apparatus. 4,641,267, Cl. 364-414.000.
Asai, Kuniaki: *See*—
Saito, Teruo; Asai, Kuniaki; Suzuki, Yasuro; and Kagiya, Kei, 4,640,961, Cl. 525-444.000.
Asami, Keiichi: *See*—
Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, 4,640,971, Cl. 528-129.000.
Asano, Katsuhiro; Inaguma, Yukio; and Iwama, Norio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method of and apparatus for controlling current of inverter. 4,641,075, Cl. 318-811.000.
Asano, Mitsuru: *See*—
Yamamoto, Shinichi; Ito, Toshihiko; and Asano, Mitsuru, 4,640,454, Cl. 228-161.000.
Asano, Toshiaki: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.
Asaoka, Keizo: *See*—
Koiwai, Sakae; Asaoka, Keizo; Shirasawa, Katsuhiko; Watanabe, Hiroyuki; and Honda, Junichi, 4,640,001, Cl. 29-572.000.
Asaumi, Seiji: *See*—
Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, 4,641,156, Cl. 346-160.000.
Asea Aktiebolag: *See*—
Jacobsson, Curt, 4,641,088, Cl. 324-86.000.
Asea Stal AB: *See*—
Brannstrom, Roine, 4,640,205, Cl. 110-347.000.
Asher Technologies, Inc.: *See*—
Riner, Wilbur L.; and Watson, Bruce W., 4,640,989, Cl. 379-94.000.
Ashland Oil, Inc.: *See*—
Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., 4,640,969, Cl. 528-73.000.
Streets, Roger L.; Rabito, Thomas G.; and Peresie, David N., 4,640,730, Cl. 156-334.000.
Ashworth, John F. H. Trawl doors. 4,640,037, Cl. 43-9.000.
Aso, Koichi: *See*—
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.

Assinder, Ivar; Supran, Michael K.; and Thompson, Geoffrey A. K., to Thomas J. Lipton, Inc. Food processing method to avoid non-enzymatic browning. 4,640,840, Cl. 426-399.000.

AT&T Bell Laboratories: *See—*
Coulthart, Kenneth B.; Fairfield, Robert C.; and Mortenson, Robert L., 4,641,102, Cl. 328-62.000.
Kemper, Kyran B.; and Vetter, Robert W., Jr., 4,641,299, Cl. 370-15.000.
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,641,179, Cl. 358-12.000.
Scalera, Michael, 4,641,218, Cl. 361-119.000.
Walsh, Patrick M., 4,641,266, Cl. 364-200.000.

AT&T Company: *See—*
Kemper, Kyran B.; and Vetter, Robert W., Jr., 4,641,299, Cl. 370-15.000.

AT&T Information Systems Inc.: *See—*
Lewis, George L., 4,640,032, Cl. 40-316.000.
Rose, Richard C., 4,640,992, Cl. 379-89.000.

Atlantic Richfield Company: *See—*
Blair, Christon R.; and Parker, Kenneth B., 4,640,647, Cl. 405-224.000.
Mancinelli, Paul A., 4,640,958, Cl. 525-193.000.
Roberts, Ernest E.; Hansel, Paul H.; and Hudgens, William O., 4,640,734, Cl. 156-562.000.
Schuh, Frank J., 4,640,353, Cl. 166-248.000.

Atsumi, Morihiro: *See—*
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, 4,640,996, Cl. 200-19.00R.

Atterbury, William G.: *See—*
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., 4,641,027, Cl. 250-237.00G.

Atzmon, Michael; Johnson, William L.; and Verhoeven, John D., to California Institute of Technology. Metastable alloy materials produced by solid state reaction of compacted, mechanically deformed mixtures. 4,640,816, Cl. 419-24.000.

Audeh, Costandi A., to Mobil Oil Corporation. Process for the elimination of pyrite. 4,640,692, Cl. 44-1.0SR.

Auerbach, Daniel J.: *See—*
Alnot, Patrick R.; Auerbach, Daniel J.; Brundle, Christopher R.; and Miller, Dolores C., 4,640,718, Cl. 134-2.000.

Auinger, Herbert, to Siemens Aktiengesellschaft. Rotor for an electrical machine with axial and radial cooling channels. 4,641,051, Cl. 310-61.000.

Ault, Joseph W.: *See—*
Hong, Ki C.; Griston, Suzanne; and Ault, Joseph W., 4,640,355, Cl. 166-269.000.

Ault, Russell L.: *See—*
Harris, Ronald R.; and Ault, Russell L., 4,640,065, Cl. 52-204.000.

Austin Rover Group Limited: *See—*
Green, Robert, 4,640,239, Cl. 123-146.50A.

Automotive Products plc: *See—*
Leigh-Monstevens, Keith V., 4,640,478, Cl. 248-27.100.

AVA International Corporation: *See—*
Akkerman, Neil H.; and Hare, John P., 4,640,350, Cl. 166-117.500.

Avison, Gerald; Teape, John W.; and Willer, Paul H. F., to Bowthorpe-Hellermann Limited. Automatic tie gun. 4,640,320, Cl. 140-93.00A.

Ayala, Henry. Reinforcing bar support clip. 4,640,063, Cl. 52-127.300.

Ayata, Naoki, to Canon Kabushiki Kaisha. Measurement method and apparatus for alignment. 4,641,257, Cl. 364-559.000.

Ayata, Naoki: *See—*
Tazawa, Shigemoto; and Ayata, Naoki, 4,641,071, Cl. 318-640.000.

Ayers, Ray R.: *See—*
Simpson, Wayne F.; Ayers, Ray R.; and Patterson, Robert W., 4,640,645, Cl. 405-63.000.

Azzopardi, Michael J.: *See—*
Moore, Robert W.; and Azzopardi, Michael J., 4,640,657, Cl. 414-347.000.

Baba, Toru, to Kioritz Corporation. Mowing apparatus. 4,640,084, Cl. 56-12.700.

Babcock & Wilcox Company, The: *See—*
Flora, John H.; and Powers, Thomas, Jr., 4,640,132, Cl. 73-602.000.

Badin, Suzan; Moulin, Jean-Francois; Delattre, Luc; and Renan, Patrice, to Essilor International Cie Generale d'Optique. Grinding machine for guided or non-guided beveling or grooving of an ophthalmic lens. 4,640,055, Cl. 51-101.0LG.

Baglee, David A.: *See—*
Malhi, Satwinder; and Baglee, David A., 4,641,173, Cl. 357-51.000.

Bailey, Peter D., to Texscan Corporation. Radio frequency chokes having two windings and means for dampening parasitic resonances. 4,641,115, Cl. 333-181.000.

Baird Manufacturing Company: *See—*
Looney, Raymond H., 4,640,304, Cl. 137-202.000.

Baker, Mark G. B., to Ferranti, plc. Imaging device. 4,641,038, Cl. 250-578.000.

Baker Oil Tools, Inc.: *See—*
Wetzel, Rodney J., 4,640,370, Cl. 175-4.600.

Bakken, John A. Chain saw carriage. 4,640,170, Cl. 83-794.000.

Balding, David P.; Hsu, Li-Chien; and Gordon, Lucas S., to American Hospital Supply Corporation. Stress crack reduction in polycarbonate parts. 4,640,819, Cl. 422-22.000.

Baldwin Technology Corporation: *See—*
McMahon, Raymond D.; Jellovitz, John C.; Vaile, James T.; Renn, Gregory J.; and Ondeck, Elmer J., 4,640,165, Cl. 83-346.000.

Baliga, Bantval J., to General Electric Company. Pinch rectifier. 4,641,174, Cl. 357-58.000.

Ballard, Donna J.: *See—*
Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., 4,640,837, Cl. 426-94.000.

Ballard Medical Products: *See—*
Ford, George W., Jr.; and Palmer, Darrel R., 4,640,440, Cl. 222-190.000.

Ballendux, Gerardus M.: *See—*
Quick, David C.; McCormick, Stephen J.; and Ballendux, Gerardus M., 4,640,152, Cl. 74-767.000.

Ballester, Edwin, to Cozzoli Machine Co. Method and apparatus for filling a receptacle with a material. 4,640,322, Cl. 141-5.000.

Bandari, Ardeshir: *See—*
Dunnigan, Gerald; and Bandari, Ardeshir, 4,641,013, Cl. 219-364.000.

Banks, Christopher P.; and Irving, Edward, to Ciba-Geigy Corporation. Method of electrocoating metallic surfaces. 4,640,753, Cl. 204-181.700.

Bannon, Robert P.; and Marple, Stanley, to Shell Oil Company. Multistage condensation process. 4,640,743, Cl. 203-87.000.

Baran, Anthony S.: *See—*
Marchegiano, Joseph E.; and Baran, Anthony S., 4,641,256, Cl. 364-525.000.

Barbee, Robert B.: *See—*
Davis, Burns; and Barbee, Robert B., 4,640,973, Cl. 528-208.000.

Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, to International Business Machines Corporation. Vacuum deposition system with improved mass flow control. 4,640,221, Cl. 118-689.000.

Bares Group, The: *See—*
Anderson, J. Edward C.; and Osborn, Merritt A., 4,640,117, Cl. 72-410.000.

Barker, Don P. S.: *See—*
Van Hoomissen, Robert L.; Briscoe, Terry L.; and Barker, Don P. S., 4,640,496, Cl. 254-415.000.

Barker, Irvy T.: *See—*
Printiss, Frederick H., Sr.; and Barker, Irvy T., 4,640,536, Cl. 285-367.000.

Barker, Laurence S.: *See—*
Redding, Thomas P.; and Barker, Laurence S., 4,640,602, Cl. 355-3.0SH.

Barnett, Gary A., to M. Lowenstein Corporation. Synthetic leather sheet material products. 4,640,858, Cl. 428-90.000.

Barr, John D.; and Fuller, John M., to NL Industries, Inc. Drill bit and cutter therefor. 4,640,375, Cl. 175-410.000.

Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., to Hewlett-Packard Company. Vector network analyzer with integral processor. 4,641,086, Cl. 324-77.00R.

Barr, William A. Valve assembly for use in brake pressure control unit. 4,640,554, Cl. 303-6.00C.

Barry, John C. Emergency air access and signal. 4,640,278, Cl. 128-206.120.

Bartell Industries Ltd.: *See—*
Zelenka, Frank, 4,640,553, Cl. 299-39.000.

Barton, John S.: *See—*
Brogdon, James W.; Allen, Kenneth D.; Barton, John S.; and Hicks, Raymond J., 4,640,153, Cl. 74-789.000.

Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, to Ciba-Geigy Corporation. Acylated sugar derivatives, processes for their manufacture, and their use. 4,640,911, Cl. 514-42.000.

BASF Aktiengesellschaft: *See—*
Leyrer, Reinhold J.; Wegner, Gerhard; and Mueller, Michael, 4,640,960, Cl. 525-388.000.
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, 4,640,749, Cl. 204-59.00R.

BASF Corporation: *See—*
Deck, Charles F.; and Carson, James E., 4,640,791, Cl. 252-75.000.

Bass, Robert H.; Macko, William J.; and Lockhart, Robert K., Jr., to Motorola, Inc. Function coding via digital addresses in a two-way system. 4,641,364, Cl. 455-32.000.

Bastian, Robert: *See—*
Diepeveen, Neal; and Bastian, Robert, 4,641,192, Cl. 358-206.000.

Bates, William T. D., to Bilbate Limited. Fluid sampling device. 4,640,297, Cl. 128-765.000.

Batesville Casket Company, Inc.: *See—*
Craft, William K., 4,639,985, Cl. 27-19.000.

Batt, Andre; and Delabie, Jacques, J. A., to Societe Nationale d'Etude et de Construction de Meteur d'Aviation S.N.E.C.M.A. Electro-magnetic screening device for electrical cabling constituting bundles of cables comprising tappings. 4,640,980, Cl. 174-36.000.

Battelle Memorial Institute: *See—*
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., 4,641,027, Cl. 250-237.00G.
Rosenberg, Harvey S., 4,640,825, Cl. 423-235.000.

Battiston, Joseph, Jr.: *See—*
Battiston, Joseph D., Sr.; and Battiston, Joseph, Jr., 4,640,301, Cl. 135-67.000.

Battiston, Joseph D., Sr.; and Battiston, Joseph, Jr., to Tubular Fabricators Industry, Inc. Foldable walker with plunger actuated latch assembly. 4,640,301, Cl. 135-67.000.

Bauder, Albrecht: *See—*
Schiel, Christian; and Bauder, Albrecht, 4,639,990, Cl. 29-116.00R.

Baumann, Arthur N., to International Minerals & Chemical Corp. Separation of dissolved substances from wet process phosphoric acid. 4,640,828, Cl. 423-321.00R.

Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., to Milliken Research Corporation. Colored thermoplastic resin composition containing a colorant having an alkylenoxy-substituted chromophore group. 4,640,690, Cl. 8-506.000.

Baumgartner, Josef: *See*—
Stalder, Herbert; Baumgartner, Josef; and Wurmli, Arthur, 4,640,089, Cl. 57-401.000.

Baxter Travenol Laboratories, Inc.: *See*—
Cabernoch, James L., 4,640,425, Cl. 215-11.00E.
White, Leonard A., 4,640,424, Cl. 215-11.00R.

Bay Mills Limited: *See*—
Porter, John F., 4,640,864, Cl. 428-334.000.

Bayer Aktiengesellschaft: *See*—
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, 4,640,923, Cl. 514-272.000.
Zecher, Wilfried; Reinking, Klaus; and Kleiner, Frank, 4,640,970, Cl. 528-73.000.

Baylor College of Medicine: *See*—
Sheng, Hwai-Ping; Garza, Cutberto; Winter, Dean C.; and Deskins, William G., 4,640,130, Cl. 73-579.000.

BBC Brown, Boveri & Company, Limited: *See*—
Duerig, Thomas; Escudier, Marcel; and Keller, Jakob, 4,640,806, Cl. 264-9.000.

Beard, Robert W., to Oximetrix, Inc. Combination surgical scalpel and electrosurgical instrument. 4,640,279, Cl. 128-303.140.

Bechtle, Daniel W.: *See*—
Belohoubek, Erwin F.; and Bechtle, Daniel W., 4,641,106, Cl. 330-286.000.

Becker, Scott T.; Bergman, Michael J.; and Lee, Shueh-Mien, to Signetics Corporation. NOR gate with logical low output clamp. 4,641,046, Cl. 307-448.000.

Beckwith, Elaine C.: *See*—
Williams, Robert M.; and Beckwith, Elaine C., 4,640,826, Cl. 423-263.000.

Becton Dickinson and Company: *See*—
Carroll, Richard J.; Luderer, Albert A.; Smith, Ward C.; and Zine, Anthony R., Jr., 4,640,785, Cl. 210-782.000.

Beecham Group p.l.c.: *See*—
Willcocks, Kenneth, 4,640,928, Cl. 514-422.000.

Beestman, George B., to Monsanto Company. High concentration encapsulation by interfacial polycondensation. 4,640,709, Cl. 71-100.000.

Belanger, Inc.: *See*—
Belanger, James A., 4,640,631, Cl. 384-297.000.

Belanger, James A., to Belanger, Inc. Plastic bearing and one piece housing assembly. 4,640,631, Cl. 384-297.000.

Bell, Cecil R., Jr.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Bell Communications Research, Inc.: *See*—
Addeo, Eric J., 4,641,318, Cl. 375-38.000.

Bell, Donald G.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Belohoubek, Erwin F.; and Bechtle, Daniel W., to RCA Corporation. Radial power amplifier. 4,641,106, Cl. 330-286.000.

Bendure, William J.: *See*—
Wilson, Monti R.; Hutchison, Victor E.; Bendure, William J.; and Anderson, Frederick W., 4,641,244, Cl. 364-475.000.

Benteler-Werke AG: *See*—
Hartmann, Franz-Josef; and Hefendehl, Heinz, 4,640,115, Cl. 72-98.000.

Berfield, Robert C., to Shop-Vac Corporation. Dolly with tank latch. 4,640,521, Cl. 280-47.340.

Berg, Gunter; Muller, Otmar; and Esters, Rainer, to Diehl GmbH & Co. Adhesive medium for the bonding of surfaces in the ammunition containing explosive charges. 4,640,947, Cl. 524-109.000.

Berger, Richard. Tear pump contact lens. 4,640,594, Cl. 351-160.00R.

Bergman, Michael J.: *See*—
Becker, Scott T.; Bergman, Michael J.; and Lee, Shueh-Mien, 4,641,046, Cl. 307-448.000.

Berlese, Remo. Motorcycle boot with positive air circulation. 4,640,027, Cl. 36-131.000.

Bernklau, Daniela: *See*—
Schmid, Ralf; Otto, Johann; Bernklau, Daniela; and Knapek, Erwin, 4,640,626, Cl. 374-57.000.

Bertling, Hannes; and Leiber, Heinz, to Robert Bosch GmbH. System and method for supplying fluid under pressure for a vehicle brake system. 4,640,555, Cl. 303-10.000.

Bertotti, Franco; Ferla, Giuseppe; Musumeci, Salvatore; and Raciti, Salvatore, to SGS Microelectronica SpA. Monolithically integrated semiconductor power device. 4,641,171, Cl. 357-46.000.

Bertram, Christopher D.: *See*—
Farrell, Peter C.; Bertram, Christopher D.; and Milthorpe, Bruce K., 4,640,896, Cl. 436-34.000.

Bessam-Aire, Inc.: *See*—
Hicks, Roger J.; and Hufgard, John W., 4,640,696, Cl. 55-227.000.

Best, Steven A., to Exxon Research & Engineering Co. Polymerization catalyst, production and use. 4,640,907, Cl. 502-115.000.

Betz, John J. E. Protective method and apparatus. 4,639,945, Cl. 2-22.000.

Beutier, Didier; and Predali, Jean-Jacques, to Societe Miniere et Metallurgique de Penerroya. Process for recovering silver from sulfate solutions. 4,640,710, Cl. 75-108.000.

Beyeler Machines, S.A.: *See*—
Dieperink, Willem; and Vruggink, Arend, 4,640,113, Cl. 72-21.000.

Beyers, Billy W., Jr., to RCA Corporation. Television system scheduler with on-screen menu type programming prompting apparatus. 4,641,205, Cl. 360-33.100.

Bhat, Deepak G.; Shah, Dhirajlal C.; Kyle, John R.; and Woerner, Paul F., to GTE Valeron. Coated silicon nitride cutting tool and process for making. 4,640,693, Cl. 51-295.000.

Bickar, Ray: *See*—
Norcia, John A.; Bickar, Ray; and Wheatley, William M., 4,640,323, Cl. 141-18.000.

Bigo, Jean. Light push chairs of the foldable type. 4,640,519, Cl. 280-42.000.

Bigott, Jeffry J. Telescopic roller. 4,640,404, Cl. 193-35.0TE.

Bilbate Limited: *See*—
Bates, William T. D., 4,640,297, Cl. 128-765.000.

Billings, William G., to Phillips Petroleum Company. Process for upgrading carbonaceous material comprising liquid extraction and flash pyrolysis of extraction residue. 4,640,760, Cl. 208-390.000.

Binder, Hans, to USM Corporation. Automatic join and sew process for shoes. 4,639,964, Cl. 12-142.0LC.

Binnersley, Edwin K.; and Krueger, William H., to Du Pont de Nemours, E. I., and Company. Fiber reinforced thermoplastic material. 4,640,861, Cl. 428-294.000.

Bio-Dynamics Research & Development Corporation: *See*—
Simmons, James A., 4,640,134, Cl. 73-648.000.

Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione derivatives. 4,640,708, Cl. 71-98.000.

Birrittella, Mark S., to Motorola, Inc. Complex direct coupled transistor logic. 4,641,047, Cl. 307-454.000.

Bitrolf, Ehrenfried: *See*—
Diener, Jorg; and Bitrolf, Ehrenfried, 4,640,124, Cl. 73-116.000.

Bittner, Friedrich; Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; and Splett, Erich, to Degussa Aktiengesellschaft. Process for the production of sodium polysulfides from the elements sodium and sulfur. 4,640,832, Cl. 423-562.000.

Blackburn, James R., to Jim Blackburn Designs, Inc. Handle bar mounted quick disconnect bottle cage. 4,640,449, Cl. 224-41.000.

Blackburn, Peggy A.: *See*—
Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., 4,640,969, Cl. 528-73.000.

Blair, Christon R.; and Parker, Kenneth B., to Atlantic Richfield Company. Offshore well apparatus and method. 4,640,647, Cl. 405-224.000.

Blancheton, Jean-Paul; Calvas, Jacques; Michel, Alain H.; and Vonau, Vincent, to Institut Francais de Recherche pour l'Exploitation de la Mer - IFREMER. Intensive shrimp breeding process. 4,640,227, Cl. 119-2.000.

Bland, Todd A. Hand-held hair dryer having housed radio receiver. 4,641,014, Cl. 219-370.000.

Blaw Knox Corporation: *See*—
Moore, James G.; Obey, James H.; and Pinkel, Edward B., 4,640,740, Cl. 159-13.100.

Blecher, Peter, to Ermossa AG. Floor plate. 4,640,073, Cl. 52-403.000.

Blickle, Peter, to Hoechst Aktiengesellschaft. Process for the preparation of 3-hydroxy-3-methylglutaric acid. 4,640,750, Cl. 204-79.000.

Blizzard, Cyril A. M., to Pratt & Whitney Canada Inc. Apparatus for improving acceleration in a multi-shaft gas turbine engine. 4,640,091, Cl. 60-39.290.

Blomback, Birger; and Okada, Masahisa, to New York Blood Center, Inc. Fibrin gel-containing filter. 4,640,778, Cl. 210-484.000.

Bloomfield Industries, Inc.: *See*—
Roberts, Melvin F., 4,641,011, Cl. 219-328.000.
Roberts, Melvin F., 4,641,012, Cl. 219-331.000.

Bloor, Stephen T.: *See*—
Clark, Peter J.; Hudd, Anthony W.; Bloor, Stephen T.; and Roller, Erling, 4,640,335, Cl. 164-440.000.

Blosser, Gabe F.: *See*—
Blosser, Henry G.; Burleigh, Richard J.; Blosser, Gabe F.; and Jemison, Emanuel B., 4,641,104, Cl. 328-234.000.

Blosser, Henry G.; and Milton, Bruce F., to Board of Trustees operating Michigan State University. Superconducting synchrocyclotron. 4,641,057, Cl. 313-62.000.

Blosser, Henry G.; Burleigh, Richard J.; Blosser, Gabe F.; and Jemison, Emanuel B., to Board of Trustees operating Michigan State University. Superconducting medical cyclotron. 4,641,104, Cl. 328-234.000.

Blum, Richard S. Pill dispenser. 4,640,560, Cl. 312-234.100.

Board of Trustees operating Michigan State University: *See*—
Blosser, Henry G.; and Milton, Bruce F., 4,641,057, Cl. 313-62.000.
Blosser, Henry G.; Burleigh, Richard J.; Blosser, Gabe F.; and Jemison, Emanuel B., 4,641,104, Cl. 328-234.000.

Bochumer Eisenhutte Heintzmann GmbH & Co. Kg: *See*—
Koppers, Manfred; Bohnes, Karlheinz; and Amling, Friedel, 4,640,650, Cl. 405-290.000.

Bocker, Albert, to Albert Bocker GmbH & Co. Kg., Firma. Elevator comprising telescopic sections, and a locking device therefor. 4,640,387, Cl. 182-213.000.

Boden, Ogden W. Cord lock device. 4,639,978, Cl. 24-134.00R.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Huber, Bernhard, 4,640,677, Cl. 431-89.000.
Bodine, Albert G.; and Gregory, James N. Sonic cementing. 4,640,360, Cl. 166-286.000.
Boeing Company, The: *See*—
Brooks, John R., 4,641,236, Cl. 364-171.000.
Draggoo, Vaughn G., 4,641,315, Cl. 372-72.000.
Drago, Raymond, 4,640,149, Cl. 74-462.000.
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,640,525, Cl. 280-642.000.
Miller, Glen E., 4,641,025, Cl. 250-227.000.
Pace, James W., 4,640,477, Cl. 244-214.000.
Zoerb, Melvin C., 4,640,475, Cl. 244-111.000.
Boerema, Edward T.: *See*—
Watjer, Sheldon J.; and Boerema, Edward T., 4,640,542, Cl. 296-37.800.
Boffardi, Bennett P.: *See*—
Persinski, Leonard J.; Walker, Jerry L.; and Boffardi, Bennett P., 4,640,793, Cl. 252-82.000.
Bogert, Stephen R.: *See*—
Engel, William K.; and Bogert, Stephen R., 4,640,095, Cl. 60-443.000.
Bogren, Ingemar S. B. Apparatus for forming and inserting an internal lid in a container. 4,640,733, Cl. 156-380.200.
Bohan, John E., Jr.: *See*—
Adams, John T.; and Bohan, John E., Jr., 4,641,043, Cl. 307-117.000.
Bohler, Walter: *See*—
Tracy, David H.; O'Brien, Michael J.; and Bohler, Walter, 4,640,627, Cl. 374-121.000.
Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, to Ciba-Geigy Corporation. 2-phenoxypropionic acid cyanamides as herbicides. 4,640,703, Cl. 71-92.000.
Bohnes, Karlheinz: *See*—
Koppers, Manfred; Bohnes, Karlheinz; and Amling, Friedel, 4,640,650, Cl. 405-290.000.
Boisson, Gerard, to Schlumberger Technology Corporation. Method for actuating a tool in a well at a given depth and tool allowing the method to be implemented. 4,640,354, Cl. 166-250.000.
Bokmiller, David J.; and Heck, Samuel C., to Sani-Fresh International, Inc. Cleaning system. 4,640,638, Cl. 401-145.000.
Boliden Aktiebolag: *See*—
Dyvik, Frostein; and Borve, Kjetil, 4,640,751, Cl. 204-105.00R.
Bonal, Jean, to Jeumont-Schneider Corporation. A-C or D-C to D-C converter for dual current locomotives with D-C motors. 4,641,234, Cl. 363-124.000.
Bonfig, Karl-Walter; Himmel, Jorg; and Kuipers, Ulrich. Safety fuse assembly provided with an electro-optical indicator device. 4,641,120, Cl. 337-242.000.
Bonnyay, Laszlo: *See*—
Pietzsch, Kurt E.; and Bonnyay, Laszlo, 4,640,775, Cl. 210-387.000.
Bor, Zsolt: *See*—
Schafer, Fritz P.; Szatmari, Sandor; and Bor, Zsolt, 4,641,312, Cl. 372-25.000.
Boram, Robert J., to R. F. Shoup Corporation. Electronic voting machine and system. 4,641,240, Cl. 364-409.000.
Boram, Robert J., to R. F. Shoup Corporation. Memory cartridge for electronic voting system. 4,641,241, Cl. 364-409.000.
Borden, Inc.: *See*—
Matuszak, Edward A.; Lee, Yanien; and Gillmore, Stephen R., 4,640,843, Cl. 426-560.000.
Bordignon, Abramo, to A.T.B. S.p.A. Tape wiping brush, particularly for magnetic tape cassettes and the like. 4,639,967, Cl. 15-256.500.
Borenstein, David E., to Phillips Petroleum Company. Filament jet entangler. 4,639,986, Cl. 28-272.000.
Borghese, Camillo: *See*—
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.
Borjesson, Tore L., to AB Volvo. Axially engaging twin plate friction clutch with adjustment means. 4,640,399, Cl. 192-70.250.
Borve, Kjetil: *See*—
Dyvik, Frostein; and Borve, Kjetil, 4,640,751, Cl. 204-105.00R.
Bottomley, Paul A.; and Schenck, John F., to General Electrtic Company. Elliptical cross-section slotted-tube radio-frequency resonator for nuclear magnetic resonance imaging. 4,641,097, Cl. 324-318.000.
Boulanger, Henry J., to Texas Instruments Incorporated. Sealed electrical switch and mounting therefor. 4,641,121, Cl. 337-380.000.
Boulter, Donald; Gatehouse, Angharad M. R.; Gatehouse, John A.; and Cox, Roger B., to Agricultural Genetics Company, Limited. Plant protection method. 4,640,836, Cl. 424-195.100.
Bouts, Wilhelmus J.: *See*—
Simons, Petrus A. M. R.; and Bouts, Wilhelmus J., 4,640,879, Cl. 430-96.000.
Bowthorpe-Hellermann Limited: *See*—
Avison, Gerald; Teape, John W.; and Willer, Paul H. F., 4,640,320, Cl. 140-93.00A.
Walker, John G., 4,640,319, Cl. 140-93.00A.
Boyacigiller, Ziya G.: *See*—
Doluca, Tunc; and Boyacigiller, Ziya G., 4,641,129, Cl. 340-347.0AD.
Boyle, John T. A.; and Todd, Richard S., to John Wyeth & Brother Limited. 4-(cinnolinylamino or quinazolinylamino)benzenesulphonamides and intermediates therefor. 4,640,920, Cl. 514-248.000.
Boyles, William C.; Hagge, Douglas R.; and Johnston, Clifford V., to Cardinal Industries, Inc. Torsion-absorbing highway semitrailer. 4,640,528, Cl. 280-789.000.
Braddock, John C.; and Braddock, Kathy M. Non-competitive game for two or more players. 4,640,510, Cl. 273-1.00R.
Braddock, Kathy M.: *See*—
Braddock, John C.; and Braddock, Kathy M., 4,640,510, Cl. 273-1.00R.
Brademeyer, David L.; and Welch, Timothy M., to General Motors Corporation. Quick take-up master cylinder valve arrangement. 4,640,098, Cl. 60-578.000.
Brader, David G.: *See*—
Kaplan, Gary M.; Karau, Robert T.; Winney, Norman E., Jr.; and Brader, David G., 4,640,413, Cl. 206-232.000.
Bradley, Gerald R. Sublimation printing apparatus. 4,640,191, Cl. 101-470.000.
Bradley, John W. Vehicle rear seat sun visor. 4,640,543, Cl. 296-97.00K.
Brammall, Terrence N., to Trans-Guard Industries Inc. Security seal. 4,640,538, Cl. 292-323.000.
Brandenstein, Manfred; Hetterich, Hermann; and Horling, Peter, to SKF Kugellagerfabriken GmbH. Arrangement for the axial positioning and holding of a machine part in a thin wall sleeve or the like. 4,640,632, Cl. 384-537.000.
Brandt, Bertil, to Socared S.A. Rope and a mooring device, particularly for clamping goods mooring ships and anchoring floating landing stages, buoys, navigation marks and the like. 4,640,212, Cl. 114-230.000.
Brannstrom, Roine, to Asea Stal AB. Method of drying granular fuel in a fluidized bed combustion plant and a combustion plant with a drying device. 4,640,205, Cl. 110-347.000.
Bratke, Dieter N.: *See*—
Gallion, Georg A.; Bratke, Dieter N.; Helbig, Klaus; and Reuter, Karl F., 4,640,450, Cl. 224-331.000.
Brauer, Melvin: *See*—
Simone, Dominic; and Brauer, Melvin, 4,640,801, Cl. 260-407.000.
Braun, Eugene R.; and Schultz, Gary R., to Eaton Corporation. Central tire inflation system. 4,640,331, Cl. 152-417.000.
Bray, Richard L., to Eastman Kodak Company. Simplex to duplex copier apparatus. 4,640,607, Cl. 355-14.00R.
Bredemeier-Klonki, Volker: *See*—
Annecke, Karl-Heinz; and Bredemeier-Klonki, Volker, 4,641,306, Cl. 371-25.000.
Breimeier, Kurt; Eickhoff, Heinrich; Erdmann, Hans-Walter; and Kuhnel, Hans D., to Fulgurit GmbH & Co., Kommanditgesellschaft. Sashes and matching frames for windows and glass doors. 4,640,054, Cl. 49-504.000.
Bresson, Clarence R.; and Louthan, Rector P., to Phillips Petroleum Company. Ore flotation and flotation agents for use therein. 4,640,789, Cl. 252-61.000.
Brian, Rene , to Pomagalski SA. Rocker arm assembly with a fixing collar for an aerial tramway installation. 4,640,197, Cl. 104-179.000.
Bridgestone Corporation: *See*—
Takiguchi, Eiji; Yuto, Kazuaki; and Oniki, Toru, 4,640,952, Cl. 524-296.000.
Brightad Limited: *See*—
Street, Graham S. B., 4,641,178, Cl. 358-3.000.
Briscoe, Terry L.: *See*—
Van Hoomissen, Robert L.; Briscoe, Terry L.; and Barker, Don P. S., 4,640,496, Cl. 254-415.000.
Bristol-Myers: *See*—
Othmer, Ekkehard; and Othmer, Sieglinde C., 4,640,921, Cl. 514-252.000.
Bristol-Myers Company: *See*—
Kim, Choung U.; and Misco, Peter F., Jr., 4,640,799, Cl. 540-350.000.
British Gas Corporation: *See*—
Stafford, Trevor G., 4,640,732, Cl. 156-358.000.
Brogdon, James W.; Allen, Kenneth D.; Barton, John S.; and Hicks, Raymond J., to Teledyne Industries, Inc. Accessory drive for a turbine engine. 4,640,153, Cl. 74-789.000.
Bromberg, Yury: *See*—
Kucher, Alexander; Krasnov, Igor; and Bromberg, Yury, 4,640,384, Cl. 182-51.000.
Brookey, Robert L.: *See*—
Clifton, Ted G.; and Brookey, Robert L., 4,640,351, Cl. 166-127.000.
Brooks, Gary T., to Standard Oil Company (Indiana). Injection moldable polyamide-imide-phthalamide copolymers containing polyetherimides. 4,640,944, Cl. 523-205.000.
Brooks, John R., to Boeing Company, The. Programmable machine tool control system. 4,641,236, Cl. 364-171.000.
Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., to Crucible Materials Corporation. Method and assembly for producing extrusion-clad tubular product. 4,640,815, Cl. 419-8.000.
Brosius, Karl S.: *See*—
Haswell, Walter T., Jr.; Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,814, Cl. 419-8.000.
Brothers, Lance E., to Halliburton Company. Method of reducing fluid loss in cement compositions containing substantial salt concentrations. 4,640,942, Cl. 523-130.000.
Brown, Candice H., to Advanced Micro Devices, Inc. Method of making a package utilizing a self-aligning photoexposure process. 4,640,010, Cl. 29-832.000.
Brown, Omar L., to Dayton Reliable Tool & Mfg. Co. Two-out belt system. 4,640,116, Cl. 72-352.000.

Brull, Maurice A., to Tensiodyne Scientific Corporation. Method of making a device for monitoring fatigue life. 4,639,997, Cl. 29-407.000.

Brundle, Christopher R.: *See—*
Alnot, Patrick R.; Auerbach, Daniel J.; Brundle, Christopher R.; and Miller, Dolores C., 4,640,718, Cl. 134-2.000.

Brunette Machine Works, Ltd.: *See—*
Hards, John E., 4,640,160, Cl. 83-71.000.

Bruning, E. Eugene, to Caterpillar Inc. Air-fuel ratio control system having a fluid-powered broken-link mechanism. 4,640,247, Cl. 123-388.000.

Brunner, Hans-Georg, to Ciba-Geigy Corporation. Cyclohexenonecarboxylic acid derivatives with herbicidal and plant growth regulating properties. 4,640,706, Cl. 71-94.000.

Bruns, John H. Modular multi-storage building. 4,640,214, Cl. 114-263.000.

Brunswick Corporation: *See—*
Ohler, Steven W., 4,640,470, Cl. 242-84.20A.

Bryan, Barry L.; Druckerman, Martin; McDowell, Allen W.; Schneider, Ira H.; and Newkirk, Gary L., to International Business Machines Corporation. Personal computer attachment for host system display station. 4,641,262, Cl. 364-900.000.

Buback, John, to Massey-Ferguson Inc. Multiratio constant mesh change speed transmission. 4,640,146, Cl. 74-359.000.

Buckley, Alan: *See—*
Choe, Eui W.; Buckley, Alan; and Garito, Anthon F., 4,640,800, Cl. 260-396.00N.

Buekers, Valere: *See—*
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,641,009, Cl. 219-200.000.

Bulger, Ray P. Illuminated child's tray. 4,640,033, Cl. 40-324.000.

Bunch, Matthew L.; Price, J. B.; and Stitz, Robert W., to Spectrum CVD, Inc. CVD heat source. 4,640,224, Cl. 118-725.000.

Bundschuh, Robert L. Pump dispenser with slidable trigger. 4,640,444, Cl. 222-321.000.

Bunn, Robert F. Fingerprint identification system. 4,641,350, Cl. 382-4.000.

Bunschoten, Gerrit K., to Lever Brothers Company. Liquid-dispensing container. 4,640,441, Cl. 222-207.000.

Burgess, Jerry L.: *See—*
Adams, James H.; Burgess, Jerry L.; and Wagers, William C., 4,640,695, Cl. 55-130.000.

Burghoffer, Patrick; Pourprix, Michel; and Poussier, Patrick, to Commissariat a l'Energie Atomique. Aerosol sampler with cascade impaction and uniform deposition. 4,640,140, Cl. 73-863.220.

Burke Company, The: *See—*
Grist, Warren W.; and Kelly, David L., 4,640,491, Cl. 249-219.00W.

Burke, William B. Interactive book-puzzle instructional entertainment system. 4,640,512, Cl. 273-157.00R.

Burleigh, Richard J.: *See—*
Blosser, Henry G.; Burleigh, Richard J.; Blosser, Gabe F.; and Jemison, Emanuel B., 4,641,104, Cl. 328-234.000.

Burleson, James C., to Ozo-Tek, Inc. Method and apparatus for the generation and utilization of ozone and singlet oxygen. 4,640,782, Cl. 210-748.000.

Burn, Ian, to Du Pont de Nemours, E. I., and Company. Dielectric compositions. 4,640,905, Cl. 501-137.000.

Burr-Brown Corporation: *See—*
Albaugh, Neil P.; and Kane, Gordon R., 4,641,105, Cl. 330-9.000.
Halbert, Joel M.; and Koen, Myron J., 4,641,246, Cl. 364-487.000.

Burroughs Corporation: *See—*
Keryhuel, Alain; and Meigne, Christian, 4,641,176, Cl. 357-74.000.

Butler, Michael A.; and Ginley, David S., to United States of America, Energy. Organic metal neutron detector. 4,641,037, Cl. 250-390.000.

Buzzese, Vincent J.; and Dohnert, Mario, Jr. Head restraint for backboards. 4,640,275, Cl. 128-133.000.

C. Muller & Associates, Inc.: *See—*
Muller, Charles B., 4,641,362, Cl. 383-115.000.

Cabernoch, James L., to Baxter Travenol Laboratories, Inc. One-piece nursing container with means for storing nipple. 4,640,425, Cl. 215-11.00E.

Cagle's Inc.: *See—*
Olson, Harold D., 4,639,974, Cl. 17-46.000.

Calaway, Ward M.: *See—*
Karsh, Herbert; and Calaway, Ward M., 4,641,324, Cl. 375-76.000.

Calgon Corporation: *See—*
Persinski, Leonard J.; Walker, Jerry L.; and Boffardi, Bennett P., 4,640,793, Cl. 252-82.000.

California Institute of Technology: *See—*
Atzmon, Michael; Johnson, William L.; and Verhoeven, John D., 4,640,816, Cl. 419-24.000.

Calvas, Jacques: *See—*
Blanchelon, Jean-Paul; Calvas, Jacques; Michel, Alain H.; and Vonau, Vincent, 4,640,227, Cl. 119-2.000.

Cambridge Instrument Company plc, The: *See—*
Michalik, John K., 4,640,616, Cl. 356-136.000.

Cameron, Robert W. Composite metallic core line. 4,640,179, Cl. 87-6.000.

Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, to RIV-SKF Officine di Villar Perosa S.p.A. Oiltight hydraulic tappet for controlling an internal combustion engine valve. 4,640,238, Cl. 123-90.550.

Campbell, Neil: *See—*
Sedlacek, Robert S.; and Campbell, Neil, 4,640,228, Cl. 119-15.000.

Campoli, Ralph F., to General Defense Corporation. Rocket launching cartridge case and assembly. 4,640,195, Cl. 102-430.000.

Canada Wire and Cable Limited: *See—*
Eastwood, H. Keith; and Rivett, Paul W. J., 4,640,576, Cl. 350-96.230.

Canadian Patents & Development Ltd/Societe Canadienne des Brevets et d'Exploitation Ltd.: *See—*
Zajic, James E.; and Gerson, Donald F., 4,640,767, Cl. 208-390.000.

Cangialosi, Ignazio: *See—*
Winner, Kurt W.; and Cangialosi, Ignazio, 4,640,048, Cl. 49-181.000.

Cannon, Wayne C.: *See—*
Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., 4,641,086, Cl. 324-77.00R.

Canon Denshi Kabushiki Kaisha: *See—*
Yokota, Yuji; and Osabe, Akira, 4,641,212, Cl. 360-99.000.

Canon Kabushiki Kaisha: *See—*
Aoi, Shigeru, 4,641,157, Cl. 346-160.000.
Ayata, Naoki, 4,641,257, Cl. 364-559.000.
Hirabayashi, Hiromitsu; and Sakurai, Masaaki, 4,640,600, Cl. 355-3.0FU.
Honma, Toshio, 4,640,603, Cl. 355-3.00R.
Kawanabe, Tsuyoshi, 4,641,258, Cl. 364-710.000.
Kinoshita, Takao, 4,641,183, Cl. 358-44.000.
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,640,882, Cl. 430-110.000.
Miyagi, Ken, 4,641,197, Cl. 358-280.000.
Miyagi, Ken, 4,641,199, Cl. 358-285.000.
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro: Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.
Nojiri, Hidetoshi, 4,640,585, Cl. 350-413.000.
Ono, Takeshi, 4,641,133, Cl. 340-540.000.
Ozawa, Toshiaki; Yamada, Yasuaki; and Kondo, Hiroatsu, 4,640,634, Cl. 400-144.200.
Suzuki, Akiyoshi; and Ina, Hideki, 4,641,035, Cl. 250-548.000.
Suzuki, Takashi, 4,641,022, Cl. 250-204.000.
Takeuchi, Akihiko, 4,641,158, Cl. 346-160.000.
Tanaka, Shinya, 4,640,588, Cl. 350-516.000.
Tazawa, Shigemoto; and Ayata, Naoki, 4,641,071, Cl. 318-640.000.

Cant Investments Pty. Limited: *See—*
Cant, Peter R., 4,640,784, Cl. 210-776.000.

Cant, Peter R., to Cant Investments Pty. Limited. Method and apparatus for cleaning swimming pools. 4,640,784, Cl. 210-776.000.

Cardinal Industries, Inc.: *See—*
Boyles, William C.; Hagge, Douglas R.; and Johnston, Clifford V., 4,640,528, Cl. 280-789.000.

Cardiovascular Devices, Inc.: *See—*
Cooper, Robert P., 4,640,820, Cl. 422-68.000.

Careborg, Bengt R., to Mo och Domsjo Aktiebolag. Baby pacifier. 4,640,282, Cl. 128-360.000.

Carey, Nancy L.: *See—*
Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., 4,640,837, Cl. 426-94.000.

Cargill Detroit Corporation: *See—*
Fisher, Lee K., 4,639,963, Cl. 12-1.00A.

Carlingswitch, Inc.: *See—*
Sorenson, Richard W., 4,640,998, Cl. 200-67.00A.

Carlson, William L., Jr., to General Signal Corporation. Involute valve closure. 4,640,492, Cl. 251-163.000.

Carminati, Armelle; de Buyer, Edouard; Monomakhoff, Nicolas; and Chanut, Roland, to Carminati, Armelle; de Buyer, Edouard; and Monomakhoff, Nicolas. Device for moving a patient from his bed. 4,639,955, Cl. 5-81.00B.

Caroll, James E.: *See—*
Hoskins, John T.; Zillig, Steven R.; and Caroll, James E., 4,640,534, Cl. 285-158.000.

Carpenter, Frank, to Lake Charles Instruments, Inc. Rotary metering device useful with abrasive fluids. 4,640,125, Cl. 73-259.000.

Carre, Jean, to Groupment d'Interet Economique Aerogenerateurs Carre. Wind motors and aerogenerators. 4,641,039, Cl. 290-44.000.

Carroll, Richard J.; Luderer, Albert A.; Smith, Ward C.; and Zine, Anthony R., Jr., to Becton Dickinson and Company. Separation of lymphocytes and monocytes from blood samples. 4,640,785, Cl. 210-782.000.

Carron, Alain: *See—*
Simonin, Marcel; Garbe, Bernard; and Carron, Alain, 4,640,047, Cl. 49-47.000.

Carson, James E.: *See—*
Deck, Charles F.; and Carson, James E., 4,640,791, Cl. 252-75.000.

Carter, George B.; and Manby, Alan P., to IMI Kynoch Limited. Methods of priming explosive devices. 4,640,724, Cl. 149-109.600.

Casas, Alain: *See—*
Martinet, Roland; and Casas, Alain, 4,640,311, Cl. 137-884.000.

Casasent, David, to Teledyne Industries, Inc. General time, space and frequency multiplexed acousto-optic correlator. 4,641,273, Cl. 364-822.000.

CasChem, Inc.: *See—*
Simone, Dominic; and Brauer, Melvin, 4,640,801, Cl. 260-407.000.

Casier, Yves; Cassagne, Philippe; Gicquel, Sylvain; and Junet, Roland, to Gaz de France. Method of producing hot air and hot water for sanitary purposes and apparatus for carrying out the said method. 4,640,458, Cl. 237-17.000.

Casio Computer Co., Ltd.: *See—*
Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, 4,641,156, Cl. 346-160.000.
Casio Electronics Manufacturing Co., Ltd.: *See—*
Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, 4,641,156, Cl. 346-160.000.
Cassagne, Philippe: *See—*
Casier, Yves; Cassagne, Philippe; Gicquel, Sylvain; and Junet, Roland, 4,640,458, Cl. 237-17.000.
Caterpillar Inc.: *See—*
Bruning, E. Eugene, 4,640,247, Cl. 123-388.000.
Engel, William K.; and Bogert, Stephen R., 4,640,095, Cl. 60-443.000.
Garman, James A.; and Swift, Stephen D., 4,639,995, Cl. 29-402.080.
Whalen, Charles E.; and Hoover, Wilbur G., 4,640,771, Cl. 210-167.000.
Cauchetier, Philippe: *See—*
Mauchien, Patrick; and Cauchetier, Philippe, 4,641,032, Cl. 250-459.100.
Cause Consequence Analysis, Inc.: *See—*
Williams, Leslie P., 4,640,461, Cl. 239-317.000.
Cavezzan, Jacques; and Soula, Gerard, to Rhone-Poulenc Specialites Chimiques. Organopolysiloxane compositions for antiadhesive/-release coatings. 4,640,939, Cl. 522-99.000.
Celanese Corporation: *See—*
Choe, Eui W.; Buckley, Alan; and Garito, Anthon F., 4,640,800, Cl. 260-396.00N.
Rasoul, Husam A. A., 4,640,948, Cl. 524-157.000.
Centro Sperimentale Metallurgico S.p.A: *See—*
Podrini, Maurizio, 4,640,757, Cl. 204-206.000.
Ceraver, S.A.: *See—*
Garcera, Daniel; and Gillot, Jacques, 4,640,774, Cl. 210-323.200.
Cerdan-Diaz, Juan M.; Sanders, Michael J.; and Wellar, Mark E., to Kennecott Corporation. Spray-applied ceramic fiber insulation. 4,640,848, Cl. 427-426.000.
Chaix, Jean-Edmond; and Metteey, Michel, to Commissariat a l'Energie Atomique. Joining means between two pipes having retractable bearing members. 4,640,537, Cl. 285-368.000.
Chang, Kai: *See—*
Grote, Albert J.; Tahim, Raghbir S.; and Chang, Kai, 4,641,369, Cl. 455-327.000.
Chang, Long Fei, to Owens-Illinois, Inc. High gas barrier plastic closure. 4,640,428, Cl. 215-270.000.
Chanut, Roland: *See—*
Carminati, Armelle; de Buyer, Edouard; Monomakhoff, Nicolas; and Chanut, Roland, 4,639,955, Cl. 5-81.00B.
Chapell, Harry F., to Sage Laboratories, Inc. Microwave coupler. 4,641,111, Cl. 333-115.000.
Chardon, Georges; and Chomienne, Andre, to Faure Roux. Woven straps with transverse contractions. 4,640,317, Cl. 139-431.000.
Chasan, Dow B. System for removing air from waterbed. 4,639,961, Cl. 5-508.000.
Chase, Paul E.: *See—*
Opitz, Charles L.; and Chase, Paul E., 4,641,137, Cl. 342-52.000.
Chavoya, Robert: *See—*
Murray, Leroy J.; Olson, Lawrence N.; Chavoya, Robert; and Wade, James, 4,640,735, Cl. 156-584.000.
Chemie Linz Aktiengesellschaft: *See—*
Heinemann, Zoltan; and Konig, Heinz, 4,640,356, Cl. 166-272.000.
Chen, Chi-wan; and Schwing, Gregory W., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,640,704, Cl. 71-92.000.
Chevron Research Company: *See—*
Hong, Ki C.; Griston, Suzanne; and Ault, Joseph W., 4,640,355, Cl. 166-269.000.
Salentine, Christopher G., 4,640,827, Cl. 423-279.000.
Chikamori, Sunao: *See—*
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.
Children's Hospital Research Foundation: *See—*
Tamborski, Christ; and Clark, Leland C., Jr., 4,640,833, Cl. 424-5.000.
Chin, Te-Chien. Male organ jacket. 4,640,270, Cl. 128-79.000.
Chisholm, Bruce. Gutter cleaning tool. 4,640,540, Cl. 294-55.000.
Chisso Corporation: *See—*
Ogawa, Tetsuya; Kitano, Kisei; Goto, Yasuyuki; Fukui, Masahiro; and Sugimori, Shigeru, 4,640,795, Cl. 252-299.500.
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.
Cho, Hidetsura; Aisaka, Kazuo; and Emon, Mariko, to Suntory Limited. 3N-substituted 3,4-dihydropyrimidines as agents for treating disorders of cardiovascular system. 4,640,922, Cl. 514-256.000.
Choe, Eui W.; Buckley, Alan; and Garito, Anthon F., to Celanese Corporation. Quinodimethane compositions. 4,640,800, Cl. 260-396.00N.
Choffy, Jean-Pierre: *See—*
Lecuru, Daniel; and Choffy, Jean-Pierre, 4,640,133, Cl. 73-639.000.
Chomienne, Andre: *See—*
Chardon, Georges; and Chomienne, Andre, 4,640,317, Cl. 139-431.000.
Choong, John: *See—*
Magid, Robert; and Choong, John, 4,640,642, Cl. 403-157.000.
Chore-Time Equipment, Inc.: *See—*
Swartzendruber, Ray E.; and Coffman, Keith, 4,640,229, Cl. 119-51.110.
Van Rooijen, Gerardus H., 4,640,230, Cl. 119-52.0AF.
Chou, Tai-Sheng, to Mobil Oil Corporation. Injection of LPG into TCC unit. 4,640,763, Cl. 208-78.000.
Chrisman, Robert H.: *See—*
Grover, George M.; and Chrisman, Robert H., 4,640,347, Cl. 165-104.260.
Chrysler Motors Corporation: *See—*
Hermann, John T., 4,640,535, Cl. 285-158.000.
Ciba-Geigy Corporation: *See—*
Banks, Christopher P.; and Irving, Edward, 4,640,753, Cl. 204-181.700.
Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, 4,640,911, Cl. 514-42.000.
Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, 4,640,703, Cl. 71-92.000.
Brunner, Hans-Georg, 4,640,706, Cl. 71-94.000.
Diel, Peter J.; and Maier, Ludwig, 4,640,701, Cl. 71-86.000.
Citizen Watch Co., Ltd.: *See—*
Kushida, Hachiro, 4,640,625, Cl. 368-280.000.
Nakai, Toshihiko; and Kaneko, Masahiko, 4,640,635, Cl. 400-664.000.
Claas Ohg: *See—*
Rupprecht, Karl, 4,640,085, Cl. 56-14.600.
Clark, John I.; Eckert, Alton B.; and Warren, David M., to Pitney Bowes Inc. System for the printing and reading of encrypted messages. 4,641,346, Cl. 380-3.000.
Clark, John I.; and Dlugos, Daniel F., to Pitney Bowes Inc. System for printing encrypted messages with a character generator and bar-code representation. 4,641,347, Cl. 380-3.000.
Clark, Leland C., Jr.: *See—*
Tamborski, Christ; and Clark, Leland C., Jr., 4,640,833, Cl. 424-5.000.
Clark, Peter J.; Hudd, Anthony W.; Bloor, Stephen T.; and Roller, Erling, to IMI Refiners Ltd. Casting a[illegible]us. 4,640,335, Cl. 164-440.000.
Clark, Roger L.; Ray, Dennis D.; and Mart[illegible]ames L., to General Telephone Company of Indiana. Unitary [illegible] frame arm extender. 4,641,338, Cl. 379-328.000.
Cleland, Andrew J., to Engelhard Corpo[illegible]ulking pigment and method of making same. 4,640,716, [illegible]00.
Clifton, Ted G.; and Brookey, Robert L., to Arro[illegible] Oil Tools, Inc. Sealing packer. 4,640,351, Cl. 166-127.000.
Climax France S.A.: *See—*
Martinet, Roland; and Casas, Alain, 4,640,311, Cl. 137-884.000.
Coachmen Industries, Inc.: *See—*
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,639,953, Cl. 5-43.000.
Coburn, Robert E.; and Matthews, John A., to United Technologies Corporation. Combustion chamber rear outer seal. 4,640,092, Cl. 60-39.360.
Codex Corporation: *See—*
Wei, Lee-Fang, 4,641,327, Cl. 375-114.000.
Coffey, Gerald P.: *See—*
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., 4,640,976, Cl. 528-336.000.
Coffield, Frederick E., to United States of America, Energy. Phase comparator apparatus and method. 4,641,087, Cl. 324-83.00R.
Coffman, Keith: *See—*
Swartzendruber, Ray E.; and Coffman, Keith, 4,640,229, Cl. 119-51.110.
Colanzi, Franco: *See—*
Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, 4,640,238, Cl. 123-90.550.
Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., to General Foods Corporation. Coating composition for microwave cooking. 4,640,837, Cl. 426-94.000.
Coleman, G. A. John, to Universal Leaf Tobacco Company, Incorporated. High-pressure water-jet stripping of tobacco. 4,640,300, Cl. 131-318.000.
Coles, Donald K. Electronic musical instrument. 4,640,173, Cl. 84-1.010.
Collier, Richard J.: *See—*
Griffin, Eric J.; Collier, Richard J.; and Hjipieris, George, 4,641,082, Cl. 324-58.00B.
Collins, George J.; Rocca, Jorge J.; and Meyer, Jack D., to Applied Electron Corp. D.C. electron beam method and apparatus for continuous laser excitation. 4,641,316, Cl. 372-74.000.
Combustion Engineering, Inc.: *See—*
Adams, James H.; Burgess, Jerry L.; and Wagers, William C., 4,640,695, Cl. 55-130.000.
Holmes, Myron L.; and Smolensky, Leo A., 4,640,201, Cl. 110-245.000.
Musto, Richard L.; and Dunn, Mark R., 4,640,464, Cl. 241-34.000.
Comienco Limited: *See—*
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., 4,640,438, Cl. 220-359.000.
Commissariat a l'Energie Atomique: *See—*
Abbes, Claude; Rouaud, Christian; Valla, Jean; Forges, Robert; and de Villepoix, Raymond, 4,640,530, Cl. 285-18.000.
Burghoffer, Patrick; Pourprix, Michel; and Poussier, Patrick, 4,640,140, Cl. 73-863.220.

Chaix, Jean-Edmond; and Metteey, Michel, 4,640,537, Cl. 285-368.000.
Mauchien, Patrick; and Cauchetier, Philippe, 4,641,032, Cl. 250-459.100.

Communications Transfer Corp.: *See—*
Kaplan, Gary M.; Karau, Robert T.; Winney, Norman E., Jr.; and Brader, David G., 4,640,413, Cl. 206-232.000.

Compagnie Generale d'Automatisme CGA-HBS: *See—*
Simonin, Marcel; Garbe, Bernard; and Carron, Alain, 4,640,047, Cl. 49-47.000.

Compressor Controls Corp.: *See—*
Staroselsky, Naum; and Mirsky, Saul, 4,640,665, Cl. 415-1.000.

Comte, Pierre-Andre, to Institut Straumann AG. Conductor device, particularly for at least partial insertion in a human or animal body, comprising a spiral formed from at least one conductor. 4,640,983, Cl. 174-119.00R.

Con-Vey/Keystone, Inc.: *See—*
Jacobsen, Marvin A., 4,640,655, Cl. 414-119.000.

Concast AG: *See—*
Kumagai, Ken, 4,640,338, Cl. 164-448.000.

Condon, Harry F. Handle with alternate tool orientation. 4,640,155, Cl. 81-439.000.

Cone, Ivan H. Device for testing and calibrating treasure hunting metal detectors. 4,641,091, Cl. 324-202.000.

Conlon, Thomas R. Connector for structural systems. 4,640,572, Cl. 339-252.00R.

Conrad, Ulrich; Moser, Peter; and Gruber, Gerhard, to Daimler-Benz Aktiengesellschaft. Internal combustion engine exhaust gas recycling arrangement. 4,640,256, Cl. 123-568.000.

Consiglio Nazionale Delle Ricerche: *See—*
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.

Construction Forms, Inc.: *See—*
Klemm, Robert E., 4,640,533, Cl. 285-62.000.

Cook, Richard: *See—*
Green, George D.; Laboe, Lauren M.; and Cook, Richard, 4,641,207, Cl. 360-55.000.

Cooper, Frank W., Jr.; Howard, Bruce A.; and Snyder, David A., to Westinghouse Electric Corp. Suspension of tools for sleeving of tubes of steam generator. 4,639,994, Cl. 29-402.010.

Cooper, Robert P., to Cardiovascular Devices, Inc. Flow-through housing with blood gas sensors. 4,640,820, Cl. 422-68.000.

Cordis Corporation: *See—*
DeCote, Robert, Jr.; and Tarjan, Peter P., 4,640,285, Cl. 128-419.0PT.

Corfield, John R.; and Miller, Andrew S., to Lilly Industries Ltd. Intermediates for the preparation of penicillin and cephalosporin compounds. 4,640,798, Cl. 540-312.000.

Corsette, Douglas F. Manually operated dispensing pump. 4,640,443, Cl. 222-321.000.

Cosson, Colin; and Hopper, Laurence E. Silk screen transfer printing apparatus for cylindrical objects. 4,640,188, Cl. 101-39.000.

Costello, Thomas J.: *See—*
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Cotton, John M.: *See—*
Van Simaeys, Francoise C. G.; Leurs, Anna M. C.; Upp, Daniel C.; Lawrence, Alan J.; and Cotton, John M., 4,641,301, Cl. 370-58.000.

Coulthart, Kenneth B.; Fairfield, Robert C.; and Mortenson, Robert L., to AT&T Bell Laboratories. Random number generator. 4,641,102, Cl. 328-62.000.

Couprie, Francois, to Gaz de France. Device for evacuating into the ambient air combustion products from a condensation boiler. 4,640,232, Cl. 122-7.00R.

Cox, Roger B.: *See—*
Boulter, Donald; Gatehouse, Angharad M. R.; Gatehouse, John A.; and Cox, Roger B., 4,640,836, Cl. 424-195.100.

Cozzoli Machine Co.: *See—*
Ballester, Edwin, 4,640,322, Cl. 141-5.000.

Craft, William K., to Batesville Casket Company, Inc. Snap-in casket dish. 4,639,985, Cl. 27-19.000.

Craig Medical Products, Limited: *See—*
Steer, Peter L., 4,640,494, Cl. 251-354.000.

Craighead, Lawrence W., to Minnesota Mining and Manufacturing Company. Biomedical electrode. 4,640,289, Cl. 128-639.000.

Cramm, Russell H.: *See—*
Lancaster, Gerald M.; Kelley, David C.; Cramm, Russell H.; and Neywick, Charles V., 4,640,865, Cl. 428-421.000.

Cristian, Athos, to SASIB S.p.A. Device for wrapping a junction band around a pair of cigarettes. 4,640,013, Cl. 131-94.000.

Croll, Theodore P. Hand-held light filter. 4,640,685, Cl. 433-141.000.

Crookston, Ronald W.; and Meyer, Jeffry R., to Electric Power Research Institute, Inc. Actuator for electrical circuit interrupter using nitrocellulose type solid propellant. 4,641,000, Cl. 200-148.00R.

Crotti, Aldo, to Italtractor Meccanica ITM S.p.A. Bearing seal for endless track rollers. 4,640,559, Cl. 305-11.000.

Crowe, Wayne D., to Ferranti-Subsea Systems, Ltd. Multiple-mode electrical power and communications interface. 4,641,126, Cl. 340-310.00A.

Crucible Materials Corporation: *See—*
Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,815, Cl. 419-8.000.
Haswell, Walter T., Jr.; Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,814, Cl. 419-8.000.

Cruz-Uribe, Antonio S., to Pitney Bowes Inc. Notched piezo-electric transducer for an ink jet device. 4,641,153, Cl. 346-140.00R.

Cukon, Viktor. Golf club adjusting machine. 4,640,017, Cl. 33-508.000.

Cummins, James M.: *See—*
Cummins, Michael; Cummins, James M.; and Theys, Raymond A., 4,640,142, Cl. 74-501.00R.

Cummins, Michael; Cummins, James M.; and Theys, Raymond A., to NI Industries, Inc. Adjustable automobile mirror system. 4,640,142, Cl. 74-501.00R.

Cummins, Richard D., to Moog Inc. Electro-mechanical actuator. 4,641,072, Cl. 318-687.000.

Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., to Standard Oil Company, The. Process for the manufacture of polyamide from diamine and diamide utilizing oxygenated compound of carbon, boron, nitrogen and sulfur as catalyst. 4,640,976, Cl. 528-336.000.

Cutburth, Ronald W., to United States of America, Energy. Support mechanism for a mirrored surface or other arrangement. 4,640,591, Cl. 350-632.000.

Daido, Toshihiko; Matsubara, Hideo; and Hirakushi, Shuzo, to Koyo Seiko Kabushiki Kaisha; and Koyo Jidoki Kabushiki Kaisha. Apparatus for controlling a steering force of a handle in automobiles. 4,640,380, Cl. 180-141.000.

Daimler-Benz Aktiengesellschaft: *See—*
Conrad, Ulrich; Moser, Peter; and Gruber, Gerhard, 4,640,256, Cl. 123-568.000.

Dainippon Ink and Chemicals, Inc.: *See—*
Mitani, Tomomasa; and Mihata, Ichiro, 4,640,966, Cl. 526-249.000.
Nakamura, Chiaki; Oe, Koji; Muta, Tomonobu; Sasaki, Toshiki; and Nishio, Yoshihiro, 4,640,887, Cl. 430-275.000.

Dale Electrons, Inc.: *See—*
Person, Herman R., 4,641,114, Cl. 333-161.000.

Dalling, N. Lawrence; and Gordon, Linda A., to Survival Technology, Inc. Audible signal autoinjector training device. 4,640,686, Cl. 434-262.000.

Dalmau Guell, Jose M., to Jumberca, S.A. Needle selection arrangement for a circular knitting machine. 4,640,104, Cl. 66-222.000.

Dalton, Murphy L., Jr. Magnetometer circuit for measuring the period of beat frequency maxima. 4,641,094, Cl. 324-302.000.

D'Amico, Arnaldo: *See—*
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.

Damico, Joyce A.: *See—*
Ales, Thomas M.; Strohbeen, David T.; Damico, Joyce A.; Van Gompel, Paul T.; and Abel, Kent W., 4,639,949, Cl. 2-400.000.

Dana Corporation: *See—*
Lane, Wendell C., Jr., 4,640,997, Cl. 200-61.540.

Danby, Philip, to Refac Electronics Corporation. Polyphase electrical signal measuring apparatus. 4,641,090, Cl. 324-107.000.

Dandl, Raphael A., to Applied Microwave Plasma Concepts, Inc. Method and apparatus using electron cyclotron heated plasma for vacuum pumping. 4,641,060, Cl. 315-111.710.

Daniele, Joseph J., to Xerox Corporation. High resolution, high efficiency I.R. LED printing array fabrication method. 4,639,999, Cl. 29-569.00L.

D'Aniello, Alfonso: *See—*
Portmann, Niklaus; and D'Aniello, Alfonso, 4,641,008, Cl. 219-84.000.

Darrow, John O. G., to American Standard Inc. Fail-safe one and only one signal checking circuit. 4,641,045, Cl. 307-350.000.

Davis, Burns; and Barbee, Robert B., to Eastman Kodak Company. Polyamide resin capable of forming containers having improved gas barrier properties from phenylene dioxy diacetic acid and naphthalene dicarboxylic acid. 4,640,973, Cl. 528-208.000.

Davis, Dwin S. Vehicle security alarm. 4,641,124, Cl. 340-64.000.

Davis, H. Coleman: *See—*
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,639,953, Cl. 5-43.000.

Davis, Haggai D. Diverter including apparatus for breaking up large pieces of formation carried to the surface by the drilling mud. 4,640,372, Cl. 175-208.000.

Davis, Sherman G., to Gibco Division, The Mogul Corporation. Biphasic media culture apparatus. 4,640,895, Cl. 435-296.000.

Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., to International Business Machines Corporation. Adjustable support for display monitor. 4,640,485, Cl. 248-422.000.

Day Star Concepts: *See—*
Lakes, Sherman, 4,640,862, Cl. 428-308.400.

Dayton Reliable Tool & Mfg. Co.: *See—*
Brown, Omar L., 4,640,116, Cl. 72-352.000.

DCI Marketing: *See—*
Hornblad, Richard P.; and Sorensen, Gerald R., 4,640,029, Cl. 40-5.000.

De La Rue Giori S.A.: *See—*
Hernandez, Manolo, 4,640,189, Cl. 101-177.000.

Dean, Andrew, to International Standard Electric Corporation. Local area network. 4,641,375, Cl. 455-607.000.

Dearden, Guy L.; and Hayden, Owen, to National Nuclear Corporation Limited. Tube-in-shell heat exchangers. 4,640,343, Cl. 165-70.000.

de Buyer, Edouard: *See—*
Carminati, Armelle; de Buyer, Edouard; Monomakhoff, Nicolas; and Chanut, Roland, 4,639,955, Cl. 5-81.00B.

Deck, Charles F.; and Carson, James E., to BASF Corporation. Water-based functional fluids thickened by the interaction of an associative polyether thickener and certain fatty acid amides. 4,640,791, Cl. 252-75.000.

Decker, Joseph A., Jr.; Fiore, Joseph F., Jr.; and Katz, Stanley A., to Igloo Corporation. Accessory bag for containers. 4,640,392, Cl. 190-108.000.

DeCote, Robert, Jr.; and Tarjan, Peter P., to Cordis Corporation. Sense margin evaluation system and method for use same. 4,640,285, Cl. 128-419.0PT.

Deere & Company: *See—*
Dobberpuhl, Dale R.; and Stricker, David K., 4,640,378, Cl. 180-53.100.
Kittle, Carl E.; LaFave, Arthur J.; and Olson, David L., 4,640,368, Cl. 172-430.000.
Koltookian, Sarkis A., 4,640,401, Cl. 192-85.00R.
Teich, Christian M., 4,640,522, Cl. 280-460.00A.
Wittren, Richard A., 4,640,094, Cl. 60-385.000.

DeGasperis, Paolo: *See—*
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.

Deguchi, Yutaka; and Tsuchida, Yasuyuki, to Sanyo Electric Co., Ltd. Patent image reproducing electrophotographic machine. 4,640,601, Cl. 355-3.00R.

Degussa Aktiengesellschaft: *See—*
Bittner, Friedrich; Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; and Splett, Erich, 4,640,832, Cl. 423-562.000.

De Guzman, Luis: *See—*
Tenenbaum, Marcos; De Guzman, Luis; and Tenenbaum, Daniel M., 4,640,102, Cl. 62-294.000.

DeHaven, Vernet F.; and Warin, Francis J., to ARES, Inc. Shell feeding apparatus for guns. 4,640,182, Cl. 89-47.000.

Dehne, Clarence A., to Jervis B. Webb Company. Track member and track for conveyor trolleys. 4,640,196, Cl. 104-94.000.

Delabie, Jacques, J. A.: *See—*
Batt, Andre; and Delabie, Jacques, J. A., 4,640,980, Cl. 174-36.000.

Delattre, Luc: *See—*
Badin, Suzan; Moulin, Jean-Francois; Delattre, Luc; and Renan, Patrice, 4,640,055, Cl. 51-101.0LG.

Dellorfano, Fred M., Jr.: *See—*
Massa, Frank; and Massa, Donald P., 4,641,290, Cl. 367-106.000.

Demmer, Walter H., to U.S. Philips Corporation. Circuit arrangement for converting a digital input signal into an analog output signal. 4,641,131, Cl. 340-347.0DA.

Dennis, Mahlon D., to Strata Bit Corporation. Rotary drill bit. 4,640,374, Cl. 175-393.000.

Dennis, William E., to Dow Corning Corporation. Method for the dispersement of magnetic filler in one-part toner powder and the composition therefor. 4,640,881, Cl. 430-106.600.

DeRenzo, Joseph M. Figure eight shoe tie system. 4,640,025, Cl. 36-50.000.

Derfiny, Dennis J.; van den Heuvel, Anthony P.; and Edguer, Nihat S., to Motorola, Inc. Mounting system for stress relief in surface mounted components. 4,641,222, Cl. 361-403.000.

Derman, Jay S., to Z-Lock Company, Inc. Device for preventing unauthorized use of a cassette tape deck. 4,640,106, Cl. 70-14.000.

Dery, Ronald A.; and Jones, Warren C., to AMP Incorporated. Electrical interconnection means. 4,640,981, Cl. 174-88.00R.

Desanta, Simon, to Kusch & Co. Stizmobelwerke KG. Chair with an adjustable backrest. 4,640,548, Cl. 297-320.000.

Deskins, William G.: *See—*
Sheng, Hwai-Ping; Garza, Cutberto; Winter, Dean C.; and Deskins, William G., 4,640,130, Cl. 73-579.000.

Destree, Xavier P.; and Lazzari, Angelo A., to Eurosteel S.A. Industrial floor and construction method. 4,640,648, Cl. 405-229.000.

Deutz-Allis Corporation: *See—*
Quick, David C.; McCormick, Stephen J.; and Ballendux, Gerardus M., 4,640,152, Cl. 74-767.000.

de Villepoix, Raymond: *See—*
Abbes, Claude; Rouaud, Christian; Valla, Jean; Forges, Robert; and de Villepoix, Raymond, 4,640,530, Cl. 285-18.000.

Devine, Gregory P.: *See—*
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,640,221, Cl. 118-689.000.

Devine, Thomas M., Jr., to General Electric Company. Composite rotary anode for X-ray tube and process for preparing the composite. 4,641,334, Cl. 378-144.000.

DeVries, Robert A., to Dow Chemical Company, The. Method for recovering protic acids using reversible bases. 4,640,831, Cl. 423-481.000.

DH Technology, Inc.: *See—*
Hebert, Donald G., 4,640,633, Cl. 400-124.000.

Diatec Polymers: *See—*
Sortwell, Edwin T., 4,640,622, Cl. 366-76.000.

Didier-Werke AG: *See—*
Geller, Heinrich; Nold, Peter; Schermer, Heinz; and Rave, Ortwin, 4,640,447, Cl. 222-603.000.

Diehl GmbH & Co.: *See—*
Berg, Gunter; Muller, Otmar; and Esters, Rainer, 4,640,947, Cl. 524-109.000.

Diel, Peter J.; and Maier, Ludwig, to Ciba-Geigy Corporation. Herbicidal phosphonic acid and phosphinic acid derivatives. 4,640,701, Cl. 71-86.000.

Diener, Jorg; and Bitrolf, Ehrenfried, to Richard Wolf GmbH. Tecnoscopes. 4,640,124, Cl. 73-116.000.

Dieperink, Willem; and Vruggink, Arend, to Beyeler Machines, S.A. Sheet-bending press incorporating a device for continuous monitoring of the bending angle. 4,640,113, Cl. 72-21.000.

Diepeveen, Neal; and Bastian, Robert, to Magnavox Government and Industrial Electronics Company. Focus-corrected convergent beam scanner. 4,641,192, Cl. 358-206.000.

Diesel Kiki Co., Ltd.: *See—*
Matsunaga, Masahiro, 4,640,241, Cl. 123-198.00F.

Digital Associates Corporation: *See—*
Perlman, Eugene H.; and MacNaughton, Laurence, III, 4,641,263, Cl. 364-900.000.

D'Intino, Adamo M.: *See—*
Fish, Aaron M.; Mazoff, Stanley S.; D'Intino, Adamo M.; and Somasundaram, Hariharan, 4,640,110, Cl. 70-269.000.

Director General of Agency of Industrial Science and Technology: *See—*
Mori, Masaaki; Sano, Akira; Horiuchi, Yushi; and Okumura, Yoshihiro, 4,640,023, Cl. 34-57.00A.

Dischert, Robert A., to RCA Corporation. Progressive scan display system employing line and frame memories. 4,641,188, Cl. 358-140.000.

Dlugos, Daniel F.: *See—*
Clark, John I.; and Dlugos, Daniel F., 4,641,347, Cl. 380-3.000.

Dobberpuhl, Dale R.; and Stricker, David K., to Deere & Company. Power take-off system and isolation mounting therefor. 4,640,378, Cl. 180-53.100.

Doboy Packaging Machinery, Inc.: *See—*
Eaves, Fred W., 4,640,408, Cl. 198-460.000.

Dr. Ing.H.c.f. Porsche Aktiengesellschaft: *See—*
Ziegler, Gerhard; Gregotsch, Karl; and von Sivers, Rolf, 4,640,240, Cl. 123-193.00C.

Dohnert, Mario, Jr.: *See—*
Buzzese, Vincent J.; and Dohnert, Mario, Jr., 4,640,275, Cl. 128-133.000.

Doi, Akihiko: *See—*
Ando, Hideo; and Doi, Akihiko, 4,641,023, Cl. 250-216.000.

Doi, Koichi, to Nissan Motor Company, Limited. Air conditioner. 4,640,183, Cl. 98-2.010.

Dola, Frank P.; Siwinski, Paul P.; and Zwieg, Grover A., to AMP Incorporated. Adaptor for coupling a cable to a connector. 4,640,569, Cl. 339-143.00R.

Dolly Varden Fishing Lures: *See—*
Smith, Dale C., 4,640,040, Cl. 43-42.000.

Dolny, Gary M.; and Goodman, Lawrence A., to RCA Corporation. Bidirectional vertical power MOS device and fabrication method. 4,641,164, Cl. 357-23.400.

Doluca, Tunc; and Boyacigiller, Ziya G., to Intersil, Inc. Analog to digital converter with parallel and successive approximation stages. 4,641,129, Cl. 340-347.0AD.

Donecker, S. Bruce; Stewart, Ronald D.; and Frederick, Wayne L., to Hewlett-Packard Company. Vector network analyzer with integral processor. 4,641,085, Cl. 324-77.00R.

Donn Incorporated: *See—*
Goodworth, John P., II, 4,640,064, Cl. 52-145.000.

Dooley, Thomas: *See—*
Rowe, William; and Dooley, Thomas, 4,640,884, Cl. 430-165.000.

Dorner, Friedrich: *See—*
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.

Dorr-Oliver Incorporated: *See—*
Pietzsch, Kurt E.; and Bonnyay, Laszlo, 4,640,775, Cl. 210-387.000.

Doshi, Pratap K.; and Wilson, John F., to Westinghouse Electric Corp. Soluble burnable absorber rod for a nuclear reactor. 4,640,813, Cl. 376-327.000.

Doty, Francis D., to Doty Scientific, Inc. Parallel single turn saddle resonator for nuclear magnetic resonance signal reception. 4,641,098, Cl. 324-322.000.

Doty, Peter A.: *See—*
Soderquist, Mark E.; Muthyala, Ramaiah; Larson, William A.; and Doty, Peter A., 4,640,786, Cl. 252-8.551.

Doty Scientific, Inc.: *See—*
Doty, Francis D., 4,641,098, Cl. 324-322.000.

Douglas, Larry D., to Multiflex International, Inc. Umbilical safety joint. 4,640,163, Cl. 83-175.000.

Doutney, George J., to Pitney Bowes Inc. Method and apparatus for neutralizing residual charge on a photoconductive surface. 4,640,599, Cl. 355-3.0CH.

Dow Chemical Company, The: *See—*
Alle, Narasaiah, 4,640,959, Cl. 525-316.000.
DeVries, Robert A., 4,640,831, Cl. 423-481.000.
Fisk, Thomas E.; and Hoffman, Dwight K., 4,640,935, Cl. 521-137.000.
Grierson, Jeffrey G.; Jones, Carol A.; and Spears, William D., 4,640,818, Cl. 422-15.000.
Hefner, Robert E., Jr.; and Hunter, Douglas L., 4,640,957, Cl. 525-44.000.

Khoury, Issam A.; Heistand, Robert H., II; and Kohatsu, Iwao, 4,641,221, Cl. 361-321.000.
Lancaster, Gerald M.; Kelley, David C.; Cramm, Russell H.; and Neywick, Charles V., 4,640,865, Cl. 428-421.000.
Park, Chung P., 4,640,933, Cl. 521-94.000.
Sobieralski, Theodore J., 4,640,712, Cl. 75-251.000.
Soderquist, Mark E.; Muthyala, Ramaiah; Larson, William A.; and Doty, Peter A., 4,640,786, Cl. 252-8.551.
Wright, Donald R., 4,640,080, Cl. 53-449.000.

Dow Corning Corporation: *See*—
Dennis, William E., 4,640,881, Cl. 430-106.600.
Groenhof, Eugene D.; Romenesko, David J.; and Streu, Rick D., 4,640,792, Cl. 252-78.300.
Skoglins, Olgerts, 4,640,951, Cl. 524-266.000.
Sylvester, Judith M.; and Kimball, David J., 4,640,790, Cl. 252-62.540.

Downs, David A.; and Tecle, Haile, to Warner-Lambert Company. Diphenylmethylene piperidines, compositions and use. 4,640,925, Cl. 514-331.000.

Doyle, Walter M.: *See*—
Hughes, Norman S.; and Doyle, Walter M., 4,640,617, Cl. 356-326.000.

Dozier, Alfred R. Chemical vapor deposition reactor. 4,640,223, Cl. 118-719.000.

Draggoo, Vaughn G., to Boeing Company, The. Modified involute flashlamp reflector. 4,641,315, Cl. 372-72.000.

Drago, Raymond, to Boeing Company, The. High profile contact ratio, non-involute gear tooth form and method. 4,640,149, Cl. 74-462.000.

Draper, Robert; and Smith, Edward H., to Westinghouse Electric Corp. Model steam generator. 4,640,233, Cl. 122-488.000.

Drent, Eit, to Shell Oil Company. Process for the co-production of carboxylic acids and carboxylic acid esters. 4,640,802, Cl. 260-410.90R.

Drobish, James L., to Procter & Gamble Company, The. Dispensing package and follower deivce. 4,640,442, Cl. 222-209.000.

Druckerman, Martin: *See*—
Bryan, Barry L.; Druckerman, Martin; McDowell, Allen W.; Schneider, Ira H.; and Newkirk, Gary L., 4,641,262, Cl. 364-900.000.

Drug Delivery Systems Inc.: *See*—
Sibalis, Dan, 4,640,689, Cl. 604-20.000.

Dudzik, Henryk, to Mardon Illingworth, Ltd. Tap for a liquid container. 4,640,493, Cl. 251-342.000.

Duerig, Thomas; Eacudier, Marcel; and Keller, Jakob, to BBC Brown, Boveri & Company, Limited. Process for atomizing liquid metals to produce finely granular powder. 4,640,806, Cl. 264-9.000.

Duke University Medical Center: *See*—
Riederer, Stephen J., 4,641,095, Cl. 324-309.000.

Dumas, Theodore A., to Rockwell International Corporation. Fiber optic connector cover apparatus. 4,640,575, Cl. 350-96.200.

Duncan, Joseph L. Safety devices for overhead garage door springs. 4,640,049, Cl. 49-197.000.

Dunki-Jacobs, Robert J., to General Electric Company. Serial-parallel data transfer system for VLSI data paths. 4,641,276, Cl. 364-900.000.

Dunn, Mark R.: *See*—
Musto, Richard L.; and Dunn, Mark R., 4,640,464, Cl. 241-34.000.

Dunnigan, Gerald; and Bandari, Ardeshir, to Westcan Manufacturing Ltd. Dual stage thermostat and electric space heating system. 4,641,013, Cl. 219-364.000.

Dupin, Thierry, to Rhone-Poulenc Specialites Chimiques. Catalyst for the oxidation of hydrogen sulfide and process for the preparation of the catalyst. 4,640,908, Cl. 502-243.000.

Du Pont de Nemours, E. I., and Company: *See*—
Binnersley, Edwin K.; and Krueger, William H., 4,640,861, Cl. 428-294.000.
Burn, Ian, 4,640,905, Cl. 501-137.000.
Chen, Chi-wan; and Schwing, Gregory W., 4,640,704, Cl. 71-92.000.
Hasircoglu, Alexander W., 4,640,565, Cl. 339-45.00M.
Irwin, Robert S., 4,640,972, Cl. 528-188.000.
Luoma, Robert P., II; and Willis, Frank M., 4,640,776, Cl. 210-433.200.
Malhotra, Satish C., 4,640,955, Cl. 524-546.000.
Schroder, Hans L., 4,640,877, Cl. 430-14.000.
Vassallo, Donald A.; and Zunker, David W., 4,640,946, Cl. 524-45.000.
Wagman, Mark E., 4,640,949, Cl. 524-227.000.

Duracell Inc.: *See*—
Kelm, Roger W., 4,640,874, Cl. 429-27.000.

Durand, Philippe, to Verrerie Cristallerie d'Arques J. G. Durand & Cie. Display-packing unit for glasses and similar articles. 4,640,417, Cl. 206-426.000.

Durl, Bernd: *See*—
Richter, Wolfgang; and Durl, Bernd, 4,640,691, Cl. 8-543.000.

Dutt, Herbert V., to Sun Coast Plastics, Inc. Plastic closure for beverage container. 4,640,435, Cl. 220-307.000.

Dwyer, Robert A.; and Ott, Russell G., to RCA Corporation. Universal interface circuit for microprocessor peripherals. 4,641,261, Cl. 364-900.000.

Dycherhoff & Widmann Ag: *See*—
Jungwirth, Dieter; and Mannhart, Also, 4,640,068, Cl. 52-223.00L.

Dyckerhoff Engineering GmbH: *See*—
Wolter, Albrecht; Hartmann, Rolf; Herchenbach, Horst; and Grisar, Alexander, 4,640,203, Cl. 110-346.000.

Dyer, Stanley; Molloy, James J.; Nguyen, Thoi; Riherd, David M.; Voit, William F., Jr.; and West, Donald L., to International Business Machines Corporation. Thermal printhead with ribbon exit guide. 4,641,148, Cl. 346-76.0PH.

Dyvik, Frostein; and Borve, Kjetil, to Boliden Aktiebolag. Method for the purification of gases containing mercury and simultaneous recovery of the mercury in metallic form. 4,640,751, Cl. 204-105.00R.

Dziggel, Klaus-Peter, to Siemens Aktiengesellschaft. Conveyor system comprising electrically driven conveyor cars that are closeable by means of a cover. 4,641,245, Cl. 364-478.000.

Dzwinel, Jan, to Instytut Gornictwa Naftowego i Gazownictwa. Multifrequency method for direct airborne electromagnetic prospecting of hydrocarbon deposits. 4,641,100, Cl. 324-330.000.

E-Z-Em, Inc.: *See*—
Greene, Franklin R.; Stern, Howard S.; and Waye, Jerome D., 4,640,273, Cl. 128-136.000.

Easter, Finis C., to RCA Corporation. Switching DC-to-DC converters. 4,641,229, Cl. 363-21.000.

Eastern Technical Associates, Inc.: *See*—
Rose, Thomas H., 4,640,621, Cl. 356-434.000.

Eastman, James M., to Allied Corporation. Fuel metering system. 4,640,093, Cl. 60-39.281.

Eastman Kodak Company: *See*—
Bray, Richard L., 4,640,607, Cl. 355-14.00R.
Davis, Burns; and Barbee, Robert B., 4,640,973, Cl. 528-208.000.
Karsh, Herbert; and Calaway, Ward M., 4,641,324, Cl. 375-76.000.
Miller, Gary R.; and Gilson, Richard E., 4,640,886, Cl. 430-271.000.

Eastwood, H. Keith; and Rivett, Paul W. J., to Canada Wire and Cable Limited. Method and apparatus for tubing optical fibers. 4,640,576, Cl. 350-96.230.

Eaton Corporation: *See*—
Braun, Eugene R.; and Schultz, Gary R., 4,640,331, Cl. 152-417.000.
Roy, Richard D., 4,641,233, Cl. 363-89.000.
Vandervoort, John R., 4,640,145, Cl. 74-325.000.

Eaves, Fred W., to Doboy Packaging Machinery, Inc. Feeder with automatic zoned product timing correction. 4,640,408, Cl. 198-460.000.

Ebihara, Norio: *See*—
Nakamura, Yoshiyuki; Kato, Tetsuro; and Ebihara, Norio, 4,641,202, Cl. 358-313.000.

Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, to Unitika Ltd. Microspherical particles of resole resins and process for producing the same. 4,640,971, Cl. 528-129.000.

Eckberg, Richard P., to General Electric Company. Ultraviolet radiation-curable silicone release compositions with epoxy and/or acrylic functionality. 4,640,967, Cl. 528-26.000.

Eckert, Alton B.: *See*—
Clark, John I.; Eckert, Alton B.; and Warren, David M., 4,641,346, Cl. 380-3.000.

Edelmayer, Thomas C., to Teledyne Continental Motors. Piston pin construction and method for forming same. 4,640,641, Cl. 403-150.000.

Edguer, Nihat S.: *See*—
Derfiny, Dennis J.; van den Heuvel, Anthony P.; and Edguer, Nihat S., 4,641,222, Cl. 361-403.000.

Edmark, Karl W., III, to GCA Corporation. Microlithographic calibration scheme. 4,640,619, Cl. 356-372.000.

Edvardsson, Kurt O., to Saab Marine Electronics Aktiebolag. Method and apparatus for measuring the level of a fluent material in a container. 4,641,139, Cl. 342-124.000.

Edwards, A. Russell: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Efird, Lee A.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Efrudec GmbH: *See*—
Wunsch, Erich, 4,640,590, Cl. 350-632.000.

Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, to Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte. Method of inactivating reproducible filterable pathogens in blood products as well as a method of producing blood products. 4,640,834, Cl. 424-94.000.

Eickhoff, Heinrich: *See*—
Breimeier, Kurt; Eickhoff, Heinrich; Erdmann, Hans-Walter; and Kuhnel, Hans D., 4,640,054, Cl. 49-504.000.

EKA Group Ltd.: *See*—
Watson, Norman F., 4,640,660, Cl. 414-563.000.

Electric Power Research Institute, Inc.: *See*—
Crookston, Ronald W.; and Meyer, Jeffry R., 4,641,000, Cl. 200-148.00R.

Electropainting Sales Pty. Ltd.: *See*—
Fallas, Spyros, 4,640,220, Cl. 118-326.000.

Elevator GmbH: *See*—
Hetemaa, Kalevi; Naumanen, Esko; and Vainio, Frans, 4,640,459, Cl. 238-122.000.

Elliott, Francis J. J., Jr. Quick disconnect retainer for a detachable drumstick head. 4,640,176, Cl. 84-422.00S.

Elliott, Francis J. J., Jr. Drumsticks or mallets with para-hemispheroidal heads and their assembly. 4,640,177, Cl. 84-422.00S.

Elliott, William O., to McConway & Torley Corporation. Knuckle structure to prevent knuckle pin failure in a railway coupler. 4,640,422, Cl. 213-155.000.

Ellwood, Henry, to Farrel Corporation. Modular extruder barrel construction. 4,640,672, Cl. 425-192.00R.

Elmore, Glenn E.: *See—*
Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., 4,641,086, Cl. 324-77.00R.

ELP Products Ltd.: *See—*
Macierewicz, Jacek J., 4,640,780, Cl. 210-512.200.

Elpatronic AG: *See—*
Portmann, Niklaus; and D'Aniello, Alfonso, 4,641,008, Cl. 219-84.000.

Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., to Allied Corporation. Method of forming battery electrode by irreversible donor doping of conjugated backbone polymers. 4,640,006, Cl. 29-623.100.

Elsinger, Fritz: *See—*
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.

Elsner, Uwe: *See—*
Komossa, Werner; Hausler, Nikolaus; and Elsner, Uwe, 4,640,059, Cl. 51-5.00D.

ELTECH Systems Corporation: *See—*
Schraff, Raymond J.; Miller, Thomas M.; and Labas, Nicholas, 4,640,202, Cl. 110-336.000.

Emerson, Andrew C.; and Foster, Stephen A., to Ling Dynamic Systems Limited. Electrodynamic shakers. 4,641,050, Cl. 310-27.000.

Emerson Electric Co.: *See—*
Munson, Robert D., 4,641,061, Cl. 315-210.000.

Emhart Industries, Inc.: *See—*
Japenga, Robert J.; and Scott, Paul F., 4,641,269, Cl. 364-473.000.

Emon, Mariko: *See—*
Cho, Hidetsura; Aisaka, Kazuo; and Emon, Mariko, 4,640,922, Cl. 514-256.000.

Endress u. Hauser GmbH u. Co.: *See—*
Kastel, Walter; and Geiger, Wolfgang, 4,640,135, Cl. 73-716.000.

Engel, William K.; and Bogert, Stephen R., to Caterpillar Inc. Digital electro-hydraulic valve arrangement. 4,640,095, Cl. 60-443.000.

Engelhard Corporation: *See—*
Cleland, Andrew J., 4,640,716, Cl. 106-161.000.
Taylor, Arthur D.; and Upson, Thomas M., 4,640,752, Cl. 204-141.500.

Eppinger, Bernhard: *See—*
Janda, Ralf; and Eppinger, Bernhard, 4,640,936, Cl. 522-14.000.

Epple, Peter C., to General Motors Corporation. Torque compensating spring arrangement for seat belt retractor. 4,640,472, Cl. 242-107.000.

Erdmann, Hans-Walter: *See—*
Breimeier, Kurt; Eickhoff, Heinrich; Erdmann, Hans-Walter; and Kuhnel, Hans D., 4,640,054, Cl. 49-504.000.

Erickson, Roy O., Jr., to Rexair, Inc. Vacuum cleaner construction. 4,640,697, Cl. 55-248.000.

Ermossa AG: *See—*
Blecher, Peter, 4,640,073, Cl. 52-403.000.

Ernst, Hanspeter: *See—*
Hintsch, Otto; and Ernst, Hanspeter, 4,640,318, Cl. 139-439.000.

Escher, James C., to Gyro-Flex Corporation. Precessional exercising device. 4,640,508, Cl. 272-128.000.

ESCO Corporation: *See—*
Van Hoomissen, Robert L.; Briscoe, Terry L.; and Barker, Don P. S., 4,640,496, Cl. 254-415.000.

Escudier, Marcel: *See—*
Duerig, Thomas; Escudier, Marcel; and Keller, Jakob, 4,640,806, Cl. 264-9.000.

Eskofot A/S: *See—*
Rasmussen, Vagn N.; and Hougaard, Finn, 4,640,610, Cl. 355-73.000.

Esmil B.V.: *See—*
Klaren, Dick G., 4,640,339, Cl. 165-1.000.

Essex Group, Inc.: *See—*
Pavlov, Ivan K., 4,640,164, Cl. 83-304.000.

Essilor International Cie Generale d'Optique: *See—*
Badin, Suzan; Moulin, Jean-Francois; Delattre, Luc; and Renan, Patrice, 4,640,055, Cl. 51-101.0LG.

Esters, Rainer: *See—*
Berg, Gunter; Muller, Otmar; and Esters, Rainer, 4,640,947, Cl. 524-109.000.

Eto, Masahiro: *See—*
Inoue, Fumio; Eto, Masahiro; Shimaoka, Shoei; and Sakai, Noboru, 4,641,195, Cl. 358-242.000.

Eue, Ludwig: *See—*
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, 4,640,923, Cl. 514-272.000.

Eurosteel S.A.: *See—*
Destree, Xavier P.; and Lazzari, Angelo A., 4,640,648, Cl. 405-229.000.

Evans, Robert; and Evans, Robert, Jr., to Identicolor International, Inc. Method of forming a pressure sensitive image transfer sheet and the product thereof. 4,640,878, Cl. 430-15.000.

Evans, Robert, Jr.: *See—*
Evans, Robert; and Evans, Robert, Jr., 4,640,878, Cl. 430-15.000.

Ex-Cell-O Corporation: *See—*
Toelle, Alvin D., 4,640,308, Cl. 137-596.180.

Exxon Printing Systems, Inc.: *See—*
Mikalsen, Arthur, 4,641,154, Cl. 346-140.00R.

Exxon Research & Engineering Co.: *See—*
Best, Steven A., 4,640,907, Cl. 502-115.000.
Peiffer, Dennis G.; Kowalik, Ralph M.; and Lundberg, Robert D., 4,640,945, Cl. 523-336.000.

Fairchild Camera & Instrument Corp.: *See—*
Thomas, Michael E.; Vora, Madhukar B.; and Kapoor, Ashok K., 4,640,004, Cl. 29-590.000.

Fairfield, Robert C.: *See—*
Coulthart, Kenneth B.; Fairfield, Robert C.; and Mortenson, Robert L., 4,641,102, Cl. 328-62.000.

Falcetta, Joseph J.; and Park, Joonsup, to Alcon Laboratories, Inc. Hydrogel compositions using p-(2-hydroxyhexafluoroisopropyl) styrene as a comonomer. 4,640,965, Cl. 526-242.000.

Falcetta, Joseph J.: *See—*
Park, Joonsup; and Falcetta, Joseph J., 4,640,941, Cl. 523-107.000.

Falcone Piano Company: *See—*
Falcone, Santi, 4,640,174, Cl. 84-196.000.

Falcone, Santi, to Falcone Piano Company. Soundboard calibrator. 4,640,174, Cl. 84-196.000.

Fallas, Spyros, to Electropainting Sales Pty. Ltd. Paint booth assembly. 4,640,220, Cl. 118-326.000.

Fan, Cheng-Kuo, to Liang-Jr Lee. Fluid flow regulator for intravenous feeding device. 4,640,306, Cl. 137-390.000.

Fanini, Otto N.: *See—*
Sacarisen, Stephen P.; and Fanini, Otto N., 4,641,308, Cl. 371-16.000.

Fannin, Michael L.: *See—*
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,640,991, Cl. 379-88.000.

Fanuc Ltd: *See—*
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,641,069, Cl. 318-625.000.

Farquharson, Graeme J.: *See—*
Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., 4,640,708, Cl. 71-98.000.

Farrel Corporation: *See—*
Ellwood, Henry, 4,640,672, Cl. 425-192.00R.

Farrell, Peter C.; Bertram, Christopher D.; and Milthorpe, Bruce K., to Unisearch Limited. Whole blood clotting timer. 4,640,896, Cl. 436-34.000.

Faubl, Hermann; and Stein, Robert G., to Abbott Laboratories. Erythromycin A silylated compounds and method of use. 4,640,910, Cl. 514-29.000.

Fauck, Gerhard; Kiel, Bernd; and Ulrich, Helmut, to WABCO Westinghouse Fahrzeugbremsen GmbH. Load-dependent brake pressure regulator for motor vehicle and/or trailer brake systems. 4,640,556, Cl. 303-22.00R.

Faure Roux: *See—*
Chardon, Georges; and Chomienne, Andre, 4,640,317, Cl. 139-431.000.

Fauvel, Pierre: *See—*
Warzawski, Bernard; and Fauvel, Pierre, 4,640,876, Cl. 429-37.000.

Favorite Manufacturing, Inc.: *See—*
Martin, Eugene G.; and Risser, Dale M., 4,639,972, Cl. 17-11.000.

Feco Engineered Systems, Inc.: *See—*
Willison, Beverly G., 4,640,406, Cl. 198-377.000.

Fedder, Stephen C.; and Skudrna, Anthony J., to Producers Color Service, Inc. Fixturing apparatus for vibration dampened optical disc recording. 4,641,152, Cl. 346-137.000.

Feld, Gerhard: *See—*
Schmidt-Kufeke, Klaus-Peter; and Feld, Gerhard, 4,640,803, Cl. 261-64.300.

Felser Forest Products, Inc: *See—*
Felser, Theodore P., 4,640,069, Cl. 52-233.000.

Felser, Theodore P., to Felser Forest Products, Inc. Method and apparatus for construction of buildings to give the appearance of full log construction. 4,640,069, Cl. 52-233.000.

Fenster, Paul; Shimoni, Yair; Nissenson, Bilha; and Alperin, Noam. Misregistration correction. 4,641,352, Cl. 382-6.000.

Ferguson, Daniel J.; Schirmer, Henry G.; and Mueller, Walter B., to W. R. Grace & Co., Cryovac Div. Multi-layer packaging film and receptacles made therefrom. 4,640,856, Cl. 428-36.000.

Ferla, Giuseppe: *See—*
Bertotti, Franco; Ferla, Giuseppe; Musumeci, Salvatore; and Raciti, Salvatore, 4,641,171, Cl. 357-46.000.

Ferlan, Stephen J.: *See—*
Shallenberger, John M.; and Ferlan, Stephen J., 4,639,998, Cl. 29-426.500.

Ferranti, plc: *See—*
Baker, Mark G. B., 4,641,038, Cl. 250-578.000.

Ferranti-Subsea Systems, Ltd.: *See—*
Crowe, Wayne D., 4,641,126, Cl. 340-310.00A.

Ferraro, Thomas A., to Lock Jaws, Inc. Jaw locking means for lathe chucks. 4,640,518, Cl. 279-123.000.

Ferronniere, Michel, to Zodiac. Pneumatic boats. 4,640,217, Cl. 114-345.000.

Fery, Guy A., to Floating Sky, Inc. Mailer construction. 4,640,411, Cl. 206-216.000.

Fiat Auto S.p.A.: *See—*
Panizza, Ettore; and Premoli, Ercole, 4,640,557, Cl. 303-100.000.

Fichtel & Sachs AG: *See—*
Hartig, Franz; Fischer, Matthias; and Tomm, Dagwin, 4,640,402, Cl. 192-106.200.

Kolb, Dieter; and Pieper, Norbert, 4,640,398, Cl. 192-70.180.
Fichtel & Sachs Industries: *See*—
Lamond, Lee T.; and Staton, Richard D., 4,640,484, Cl. 248-407.000.
Filby, Charles E. Sanding tool. 4,639,989, Cl. 29-79.000.
Files, William C.; Pellerin, Norvin L.; Rodboon, Somsak S.; and Pearce, Thomas M., to Pellerin Milnor Corporation. Apparatus for treating cloth goods. 4,640,024, Cl. 34-133.000.
Finney, Donald L.: *See*—
Toub, Melvin R.; and Finney, Donald L., 4,640,956, Cl. 524-779.000.
Fiore, Joseph F., Jr.: *See*—
Decker, Joseph A., Jr.; Fiore, Joseph F., Jr.; and Katz, Stanley A., 4,640,392, Cl. 190-108.000.
Fischer, Artur; Onasch, Jurgen; and Haage, Manfred, to Fischer, Artur. Anchor. 4,640,654, Cl. 411-55.000.
Fischer, Matthias: *See*—
Hartig, Franz; Fischer, Matthias; and Tomm, Dagwin, 4,640,402, Cl. 192-106.200.
Fish, Aaron M.; Mazoff, Stanley S.; D'Intino, Adamo M.; and Somasundaram, Hariharan, to Ilco Unican Corp. Automatic delay relocking device. 4,640,110, Cl. 70-269.000.
Fisher, Lee K., to Cargill Detroit Corporation. Shoe manufacturing system. 4,639,963, Cl. 12-1.00A.
Fisher Scientific Company: *See*—
Mody, Dinesh I.; Rasmussen, James E.; and Ryaboy, Mikhail Y., 4,640,821, Cl. 422-81.000.
Fishgal, Semyon. Contaminants breaking and separation. 4,640,466, Cl. 241-40.000.
Fisk, Thomas E.; and Hoffman, Dwight K., to Dow Chemical Company, The. Addition polymerizable adducts for nonaqueous dispersions. 4,640,935, Cl. 521-137.000.
FitzGerald Corporation: *See*—
FitzGerald, Joseph M.; and FitzGerald, James P., 4,640,541, Cl. 296-1.00S.
FitzGerald, James P.: *See*—
FitzGerald, Joseph M.; and FitzGerald, James P., 4,640,541, Cl. 296-1.00S.
FitzGerald, Joseph M.; and FitzGerald, James P., to FitzGerald Corporation. Under-trailer air deflector. 4,640,541, Cl. 296-1.00S.
Fitzgerald, Mark: *See*—
Heitzmann, Richard E.; Fitzgerald, Mark; and Sawyer, James L., 4,640,715, Cl. 106-85.000.
Flack, John K.: *See*—
Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., 4,640,485, Cl. 248-422.000.
Fletcher, Alan J.: *See*—
Johnsen, Kenneth D.; and Fletcher, Alan J., 4,640,434, Cl. 220-287.000.
Floating Sky, Inc.: *See*—
Fery, Guy A., 4,640,411, Cl. 206-216.000.
Flom, Leonard; and Safir, Aran. Iris recognition system. 4,641,349, Cl. 382-2.000.
Flora, John H.; and Powers, Thomas, Jr., to Babcock & Wilcox Company, The. Enhancement of linear scan ultrasonics. 4,640,132, Cl. 73-602.000.
Fong, John; Wortzman, Mitchell S.; and Scott, Richard A., to Neutrogena Corporation. Compositions for treating acne vulgaris and methods of making and using same. 4,640,932, Cl. 514-714.000.
Ford, George W., Jr.; and Palmer, Darrel R., to Ballard Medical Products. Foam dispensing device. 4,640,440, Cl. 222-190.000.
Ford Motor Company: *See*—
George, Melvin J., 4,640,561, Cl. 339-17.00F.
Martin, Robert A.; and Heater, Thomas J., 4,640,333, Cl. 164-246.000.
Martin, Robert A.; and Heater, Thomas J., 4,640,728, Cl. 156-245.000.
Thomas, Arthur, 4,640,014, Cl. 33-143.00L.
Williams, Robert M.; and Beckwith, Elaine C., 4,640,826, Cl. 423-263.000.
Forges, Robert: *See*—
Abbes, Claude; Rouaud, Christian; Valla, Jean; Forges, Robert; and de Villepoix, Raymond, 4,640,530, Cl. 285-18.000.
Forster, Adrian; and Gehrig, Manfred, to Hopfenextraktion HVG Barth, Raiser & Co. Process for the extraction of hop substances. 4,640,841, Cl. 426-425.000.
Forster, Josef: *See*—
Weber, Robert; and Forster, Josef, 4,640,346, Cl. 165-95.000.
Forster, Jurgen; and Westendorf, Helmut. Arrangement for centering conduits. 4,640,531, Cl. 285-24.000.
Foster, Stephen A.: *See*—
Emerson, Andrew C.; and Foster, Stephen A., 4,641,050, Cl. 310-27.000.
Fox, John R.: *See*—
O'Keefe, Michael; and Fox, John R., 4,640,207, Cl. 112-236.000.
Foxon, Charles T., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,640,720, Cl. 148-175.000.
Fraioli, Joseph. Dual-valve air-gas controller. 4,640,678, Cl. 431-75.000.
Framatome: *See*—
Peletan, Rene , 4,640,811, Cl. 376-228.000.
Frank, Helmut, to Manzinger Papierwerke KG. Carrying bag with interlocking handle portions. 4,641,360, Cl. 383-15.000.
Franklin, Paul R., Jr. CO_2 snow forming header with triple point feature. 4,640,460, Cl. 239-2.200.
Franson, David C.: *See*—
Hoffman, Robert K.; Kavanaugh, Mark A.; and Franson, David C., 4,640,309, Cl. 137-596.180.
Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,640,364, Cl. 171-16.000.
Franz Sachs & Co. KG: *See*—
Stusack, Hans; and Schulz, Peter, 4,640,167, Cl. 83-649.000.
Frassica, James J. Seal device for central sections of wheel halves. 4,640,330, Cl. 152-404.000.
Frechinger, Wolfgang: *See*—
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.
Frederick, Wayne L.: *See*—
Donecker, S. Bruce; Stewart, Ronald D.; and Frederick, Wayne L., 4,641,085, Cl. 324-77.00R.
Fredericks, Edward C.; and Nanda, Madan M., to International Business Machines Corporation. Semiconductor contact protection. 4,640,738, Cl. 156-656.000.
Freeman, William T.: *See*—
Alston, Lawrence E.; and Freeman, William T., 4,641,185, Cl. 358-75.000.
French, Michael P.: *See*—
Testin, William J.; and French, Michael P., 4,641,064, Cl. 315-411.000.
Freund Industrial Co., Ltd.: *See*—
Motoyama, Shimesu; Gotou, Masakazu; Shirakawa, Hiromu; and Makino, Takamoto, 4,640,218, Cl. 118-19.000.
Frisco, Jeffrey A.: *See*—
Heckaman, Douglas E.; Higman, Roger H.; and Frisco, Jeffrey A., 4,641,140, Cl. 342-371.000.
Fritz, Harald, to Siemens Aktiengesellschaft. Strain gauge device for measuring multicomponent forces and torques. 4,640,139, Cl. 73-862.040.
Fromme, Heinrich. Adjustable swivel chair. 4,640,547, Cl. 297-301.000.
Fromson, Robert E.; Kossowsky, Ram; and Nunamaker, Charles S., to Westinghouse Electric Corp. Cemented carbide cutting tools and processes for making and using. 4,640,169, Cl. 83-685.000.
Fuji Electric Co., Ltd.: *See*—
Hongo, Yusuo; and Nitta, Yoshio, 4,641,355, Cl. 382-34.000.
Yokoyama, Shotaro; and Nishibe, Takashi, 4,640,613, Cl. 356-1.000.
Fuji Electric Corporate Research and Development, Ltd.: *See*—
Yokoyama, Shotaro; and Nishibe, Takashi, 4,640,613, Cl. 356-1.000.
Fuji Photo Film Co., Ltd.: *See*—
Aoyama, Kazunori, 4,640,473, Cl. 242-197.000.
Asai, Eiichi; Tanaka, Hiroshi; and Higashi, Nobuaki, 4,641,267, Cl. 364-414.000.
Fujita, Munehisa; and Mitsui, Akio, 4,640,890, Cl. 430-504.000.
Hashiue, Masakazu; and Ogawa, Masashi, 4,640,759, Cl. 204-299.00R.
Inatsuki, Kenichi, 4,641,019, Cl. 250-201.000.
Inuiya, Masafumi, 4,641,169, Cl. 357-30.000.
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, 4,640,892, Cl. 430-617.000.
Kimura, Tsutomu, 4,641,242, Cl. 364-414.000.
Ohgoda, Makoto; and Tamura, Kaoru, 4,640,507, Cl. 271-245.000.
Ohta, Takahiro; Inuiya, Masafumi; and Fujimura, Ikuo, 4,641,198, Cl. 358-285.000.
Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, 4,640,597, Cl. 353-79.000.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,640,891, Cl. 430-551.000.
Fujihisa, Hiroaki; Fujii, Hiroshi; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 4,641,001, Cl. 200-153.00G.
Fujii, Hideji; Hayakawa, Takayuki; Sato, Shigeru; and Yanagihara, Eiichi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Method of producing ionization chamber detector. 4,640,729, Cl. 156-257.000.
Fujii, Hiroshi: *See*—
Fujihisa, Hiroaki; Fujii, Hiroshi; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,641,001, Cl. 200-153.00G.
Fujii, Syuso: *See*—
Iizuka, Tetsuya; Fujii, Syuso; and Uchida, Yukimasa, 4,641,165, Cl. 357-23.600.
Fujikawa, Iwao: *See*—
Tsubakimoto, Tsuneo; Fujikawa, Iwao; and Kushino, Mitsuo, 4,640,584, Cl. 350-344.000.
Fujikura, Nobuyuki: *See*—
Yabushita, Masaharu; Nohmi, Makoto; Fujikura, Nobuyuki; Miyamoto, Shoji; and Ihara, Hirokazu, 4,641,237, Cl. 364-200.000.
Fujimura, Ikuo: *See*—
Ohta, Takahiro; Inuiya, Masafumi; and Fujimura, Ikuo, 4,641,198, Cl. 358-285.000.
Fujine, Manabu: *See*—
Matsushima, Katsuaki; Fujioka, Yasuhiro; Sasaki, Takeshi; Fujine, Manabu; and Yamamoto, Kouji, 4,640,184, Cl. 98-2.150.
Fujioka, Yasuhiro: *See*—
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Fujioka, Yoshiki; and Hirota, Mitsuhiko, to Fanuc Ltd. Plural motor changeover control system. 4,641,069, Cl. 318-625.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hashimoto, Masashi; Aratani, Matsuhiko; and Sawada, Kozo, 4,640,915, Cl. 514-210.000.

Fujise, Masakuni, to Tokyo Shibaura Denki Kabushiki Kaisha. Computed tomography apparatus. 4,641,328, Cl. 378-8.000.
Fujishima, Kazuyasu: *See*—
Shimotori, Kazuhiro; Fujishima, Kazuyasu; Ozaki, Hideyuki; and Miyatake, Hideshi, 4,641,286, Cl. 365-230.000.
Fujita, Munehisa; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Color photographic material with light insensitive silver chloride. 4,640,890, Cl. 430-504.000.
Fujitsu Limited: *See*—
Iizawa, Ryuji; and Murakami, Koji, 4,641,067, Cl. 318-287.000.
Kobayashi, Kenichi, 4,641,353, Cl. 382-8.000.
Okamura, Shigeru; and Taguchi, Takao, 4,641,034, Cl. 250-492.200.
Sawada, Kenji, 4,641,073, Cl. 318-696.000.
Suzuki, Yasuo, 4,641,284, Cl. 365-210.000.
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,641,166, Cl. 357-23.600.
Fujiwara, Hideyuki: *See*—
Ono, Takahiro; Akutsu, Takao; and Fujiwara, Hideyuki, 4,640,299, Cl. 131-303.000.
Fujiwara, Takeshi: *See*—
Koshigoe, Shinpei; and Fujiwara, Takeshi, 4,641,058, Cl. 313-449.000.
Fukami, Akira: *See*—
Miyoshi, Akio; and Fukami, Akira, 4,640,436, Cl. 220-359.000.
Fukaya, Kuniaki: *See*—
Fukukita, Hiroshi; Tachita, Ryobun; Fukaya, Kuniaki; and Yano, Tsutomu, 4,641,260, Cl. 364-737.000.
Fukaya, Takeo: *See*—
Kishida, Takao; and Fukaya, Takeo, 4,640,118, Cl. 73-9.000.
Fukui, Masahiro: *See*—
Ogawa, Tetsuya; Kitano, Kisei; Goto, Yasuyuki; Fukui, Masahiro; and Sugimori, Shigeru, 4,640,795, Cl. 252-299.500.
Fukui, Shinta: *See*—
Suzuki, Mamoru; and Fukui, Shinta, 4,641,248, Cl. 364-492.000.
Fukukita, Hiroshi; Tachita, Ryobun; Fukaya, Kuniaki; and Yano, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Digital signal processing apparatus for a blood flowmeter using ultrasound Doppler effect. 4,641,260, Cl. 364-737.000.
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, to Hitachi, Ltd. Apparatus for recognizing and displaying handwritten characters and figures. 4,641,354, Cl. 382-13.000.
Fukuroi, Takeo; and Inazawa, Keichi, to Nippon Notion Kogyo Co., Ltd. Hook for a hook-and-eye fastener. 4,639,983, Cl. 24-689.000.
Fukuyama, Yasuo: *See*—
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, 4,640,808, Cl. 264-46.500.
Fukuzo, Yukio, to NEC Corporation. Timing signal generator. 4,641,049, Cl. 307-590.000.
Fukuzumi, Shuzo: *See*—
Kawamura, Yoshihisa; and Fukuzumi, Shuzo, 4,640,249, Cl. 123-425.000.
Fulgurit GmbH & Co., Kommanditgesellachaft: *See*—
Breimeier, Kurt; Eickhoff, Heinrich; Erdmann, Hans-Walter; and Kuhnel, Hans D., 4,640,054, Cl. 49-504.000.
Fuller, John M.: *See*—
Barr, John D.; and Fuller, John M., 4,640,375, Cl. 175-410.000.
Fullerton, Larry W., to Phillips, Charles A., a part interest. Spread spectrum radio transmission system. 4,641,317, Cl. 375-1.000.
Fullmer, David M., to Xerox Corporation. Screw fastening method. 4,639,996, Cl. 29-407.000.
Fullmer, Douglas E.: *See*—
Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., 4,641,086, Cl. 324-77.00R.
Funae, Keizo: *See*—
Taki, Yoshihiro; Akado, Hajime; Funae, Keizo; and Inukai, Satoshi, 4,640,779, Cl. 210-493.500.
Funahashi, Yuichi: *See*—
Watanabe, Junichiro; Funahashi, Yuichi; Sugiura, Kazuo; and Matsumoto, Hironori, 4,640,968, Cl. 528-32.000.
Furukawa, Shunsuke; Suzuki, Tadao; and Monen, Marinus J. B. M., to Sony Corporation. Disc playback apparatus. 4,641,295, Cl. 369-32.000.
Furukawa, Yoshito: *See*—
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.
Fusion Systems Corporation: *See*—
Petelin, Andrei N.; Sharp, Celia M.; Ury, Michael G.; and Wooden, Gene R., 4,641,033, Cl. 250-492.100.
G. D. Societa per Azioni: *See*—
Mattei, Riccardo, 4,640,656, Cl. 414-303.000.
Neri, Armando, 4,641,024, Cl. 250-223.00R.
Gabe, Julian; and Makepeace, Richard J., to Agan Chemical Manufacturers Ltd. Method for combatting blackgrass in cereal crops and compositions therefor. 4,640,705, Cl. 71-93.000.
Gacsay, Lorant, to Sulzer Brothers Limited. Projectile weaving machine. 4,640,315, Cl. 139-1.00C.
Gal, Uzi, to UZI R & D Associates. Grip and stock assembly for facilitating use of a compact gun. 4,640,036, Cl. 42-72.000.
Gallion, Georg A.; Bratke, Dieter N.; Helbig, Klaus; and Reuter, Karl F., to General Motors Corporation. Roof rack for motor vehicles. 4,640,450, Cl. 224-331.000.
Gamble, William L., to W. E. Bassett Company, The. Nail clipper. 4,640,011, Cl. 30-28.000.
Gannaway, Edwin L., to Tecumseh Products Company. Rotary compressor lubrication arrangement. 4,640,669, Cl. 417-410.000.
Ganrot, Bertil A.: *See*—
Svengren, Anders G.; and Ganrot, Bertil A., 4,640,670, Cl. 425-142.000.
Ganss, Rolf. Process and device for producing a screen image with a three-dimensional effect in a television receiver. 4,641,177, Cl. 358-3.000.
Garavuso, Gerald M.; Liang, Shwu-Jian; and Thettu, Raghulinga R., to Xerox Corporation. Paddle wheel feeder. 4,640,504, Cl. 271-113.000.
Garbe, Bernard: *See*—
Simonin, Marcel; Garbe, Bernard; and Carron, Alain, 4,640,047, Cl. 49-47.000.
Garbe, Dietmar R. Spirometer accessory. 4,640,293, Cl. 128-716.000.
Garcera, Daniel; and Gillot, Jacques, to Ceraver, S.A. Assembly of mounted tubular filter members inside an envelope. 4,640,774, Cl. 210-323.200.
Garcia, Felix, Jr., to Texas Instruments Incorporated. Optically activated keyboard for digital system. 4,641,026, Cl. 250-229.000.
Garcia, Michel. Device for forming tunnels in composite wall panels. 4,641,016, Cl. 219-523.000.
Garito, Anthon F.: *See*—
Choe, Eui W.; Buckley, Alan; and Garito, Anthon F., 4,640,800, Cl. 260-396.00N.
Garman, James A.; and Swift, Stephen D., to Caterpillar Inc. Method of retaining and repairing a track joint. 4,639,995, Cl. 29-402.080.
Garritano, Ronald F.; O'Connor, John J.; and Papayanopulos, Manuel E., to Rheometrics, Inc. Impact testing apparatus. 4,640,120, Cl. 73-12.000.
Garza, Cutberto: *See*—
Sheng, Hwai-Ping; Garza, Cutberto; Winter, Dean C.; and Deskins, William G., 4,640,130, Cl. 73-579.000.
Gastrin, Jan, to Instrumentarium Corp. Filter arrangement for soft tissue. 4,641,336, Cl. 378-156.000.
Gatehouse, Angharad M. R.: *See*—
Boulter, Donald; Gatehouse, Angharad M. R.; Gatehouse, John A.; and Cox, Roger B., 4,640,836, Cl. 424-195.100.
Gatehouse, John A.: *See*—
Boulter, Donald; Gatehouse, Angharad M. R.; Gatehouse, John A.; and Cox, Roger B., 4,640,836, Cl. 424-195.100.
Gaz de France: *See*—
Casier, Yves; Cassagne, Philippe; Gicquel, Sylvain; and Junet, Roland, 4,640,458, Cl. 237-17.000.
Couprie, Francois, 4,640,232, Cl. 122-7.00R.
GCA Corporation: *See*—
Edmark, Karl W., III, 4,640,619, Cl. 356-372.000.
Gebruder Kommerling Kunststoffwerke GmbH: *See*—
Haffer, Dieter, 4,640,078, Cl. 52-731.000.
Gehman, John B., to General Dynamics Electronics Division. Dipole array with phase and amplitude control. 4,641,146, Cl. 343-814.000.
Gehrig, Manfred: *See*—
Forster, Adrian; and Gehrig, Manfred, 4,640,841, Cl. 426-425.000.
Geiger, Wolfgang: *See*—
Kastel, Walter; and Geiger, Wolfgang, 4,640,135, Cl. 73-716.000.
Geiser, Markus; and Vandevoir, Claude, to Sameca S.A. Process for loading a lathe with bars to be machined and loading device for carrying out of the process. 4,640,157, Cl. 82-2.700.
Geller, Heinrich; Nold, Peter; Schermer, Heinz; and Rave, Ortwin, to Didier-Werke AG. Molten metal immersion pouring spout. 4,640,447, Cl. 222-603.000.
General Aluminum Products, Inc.: *See*—
Trumley, Richard L., 4,640,061, Cl. 52-71.000.
General Defense Corporation: *See*—
Campoli, Ralph F., 4,640,195, Cl. 102-430.000.
General Dynamics Electronics Division: *See*—
Gehman, John B., 4,641,146, Cl. 343-814.000.
General Electric Company: *See*—
Baliga, Bantval J., 4,641,174, Cl. 357-58.000.
Devine, Thomas M., Jr., 4,641,334, Cl. 378-144.000.
Dunki-Jacobs, Robert J., 4,641,276, Cl. 364-900.000.
Eckberg, Richard P., 4,640,967, Cl. 528-26.000.
Hamilton, James W., Jr.; and Long, Edward A., 4,641,074, Cl. 318-706.000.
Hillig, William B.; and Musikant, Solomon, 4,640,899, Cl. 501-5.000.
Hillig, William B.; and Musikant, Solomon, 4,640,904, Cl. 501-128.000.
Hughes, William C., 4,641,325, Cl. 375-97.000.
Kushner, Gerald J.; and Toma, Daniel N., 4,640,105, Cl. 68-23.300.
Morris, Robert A.; and Rajotte, Paul T., 4,641,216, Cl. 361-45.000.
Morris, Robert A.; Rajotte, Paul T.; Russell, Ronald R.; and Kiesel, George W., 4,641,217, Cl. 361-45.000.
Sawyer, Steven D.; Hill, William D.; Wilson, Patricia A.; and Steiner, William M., 4,640,812, Cl. 376-245.000.
Toub, Melvin R.; and Finney, Donald L., 4,640,956, Cl. 524-779.000.
Walker, Loren H.; and Lezan, Georges R. E., 4,641,231, Cl. 363-58.000.
Willard, Henry G., 4,641,117, Cl. 335-7.000.
Yilmaz, Hamza, 4,641,162, Cl. 357-23.400.
General Electrtic Company: *See*—
Bottomley, Paul A.; and Schenck, John F., 4,641,097, Cl. 324-318.000.

General Foods Corporation: *See*—
Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., 4,640,837, Cl. 426-94.000.

General Motors Corporation: *See*—
Brademeyer, David L.; and Welch, Timothy M., 4,640,098, Cl. 60-578.000.
Epple, Peter C., 4,640,472, Cl. 242-107.000.
Gallion, Georg A.; Bratke, Dieter N.; Helbig, Klaus; and Reuter, Karl F., 4,640,450, Cl. 224-331.000.
Ordo, Richard A., 4,640,294, Cl. 192-70.2.
Stoltman, Donald D., 4,640,248, Cl. 423-399.000.

General Signal Corporation: *See*—
Carlson, William L., Jr., 4,640,492, Cl. 251-163.000.

General Telephone Company of Indiana: *See*—
Clark, Roger L.; Ray, Dennis D.; and Martin, James L., 4,641,338, Cl. 379-328.000.

George, Melvin J., to Ford Motor Company. Flexible printed circuit connector. 4,640,561, Cl. 339-17.00F.

Georgopoulos, George, to Levolor Lorentzen, Inc. Apparatus for producing simultaneously a plurality of Venetian blinds. 4,639,987, Cl. 29-24.500.

Gerber, Heinz J., to Gerber Scientific Inc. Marking apparatus. 4,640,222, Cl. 118-697.000.

Gerber Scientific Inc.: *See*—
Gerber, Heinz J., 4,640,222, Cl. 118-697.000.

Gerkema, Jan, to U.S. Philips Corporation. X-ray tube comprising anode disc rotatably supported by bearing having push-pull bearing on an axial face. 4,641,332, Cl. 378-125.000.

Gerson, Donald F.: *See*—
Zajic, James E.; and Gerson, Donald F., 4,640,767, Cl. 208-390.000.

Gesellschaft Fuer Kernenerg Ieverwertung in Schiffbau und Schiffahat GmbH: *See*—
Maixner, Uwe; and Milferstaedt, Dieter, 4,641,002, Cl. 200-268.000.

GETRAG Getriebe- und Zahnradfabrik GmbH: *See*—
Knodel, Gunter; and Helms, Georg, 4,640,141, Cl. 74-357.000.

Geus, Georg: *See*—
Herwig, Thomas; and Geus, Georg, 4,641,330, Cl. 378-101.000.

Geze GmbH: *See*—
Maier, Helmut; Storandt, Ralf; Guenther, Heinz, deceased; Guenther, Renate, legal representative; and Guenther, Sabine, legal representative, 4,640,051, Cl. 49-348.000.

Gibco Division, The Mogul Corporation: *See*—
Davis, Sherman G., 4,640,895, Cl. 435-296.000.

Gibot, Claude, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process and installation for cooling a viscous and in particular food product. 4,640,099, Cl. 62-62.000.

Gibson, William A.: *See*—
McConnell, Matthew L.; and Gibson, William A., 4,641,378, Cl. 455-619.000.

Gicquel, Sylvain: *See*—
Casier, Yves; Cassagne, Philippe; Gicquel, Sylvain; and Junet, Roland, 4,640,458, Cl. 237-17.000.

Gigliotti, Fred. Checkbook recording device. 4,640,018, Cl. 33-562.000.

Gill, Gurdev S., to Owens-Corning Fiberglas Corporation. Apparatus for packaging loose fibrous material. 4,640,082, Cl. 53-523.000.

Gill, Harry A., Jr., to Raytheon Company. Configurable analog integrated circuit. 4,641,108, Cl. 330-307.000.

Gillmore, Stephen R.: *See*—
Matuszak, Edward A.; Lee, Yanien; and Gillmore, Stephen R., 4,640,843, Cl. 426-560.000.

Gillot, Jacques: *See*—
Garcera, Daniel; and Gillot, Jacques, 4,640,774, Cl. 210-323.200.

Gilson, Richard E.: *See*—
Miller, Gary R.; and Gilson, Richard E., 4,640,886, Cl. 430-271.000.

Ginley, David S.: *See*—
Butler, Michael A.; and Ginley, David S., 4,641,037, Cl. 250-390.000.

Gion, Hidenori; Kubota, Kenji; Nakamura, Michihiro; and Yano, Makoto, to Kuraray Co., Ltd. Method and device for compensating temperature-dependent characteristic changes in ion-sensitive FET transducer. 4,641,249, Cl. 364-496.000.

Glaser, David M.: *See*—
Jacobine, Anthony F.; and Glaser, David M., 4,640,940, Cl. 522-99.000.

Glenn, Douglas J.: *See*—
Glenn, Julian H.; and Glenn, Douglas J., 4,640,208, Cl. 112-265.100.
Glenn, Julian H.; and Glenn, Douglas J., 4,640,209, Cl. 112-429.000.

Glenn, Julian H.; and Glenn, Douglas J., to Glenn, Douglas J. Method and apparatus for forming decorative fabrics. 4,640,208, Cl. 112-265.100.

Glenn, Julian H.; and Glenn, Douglas J., to Glenn, Douglas J. Decorative fabrics. 4,640,209, Cl. 112-429.000.

Glenn, William E., to New York Institute of Technology. Video display apparatus and method. 4,641,193, Cl. 358-233.000.

Glennon, Timothy F.; Olson, Raymond N.; and Straznickas, Donald A., to Sundstrand Corporation. Permanent magnet generator with fault detection. 4,641,080, Cl. 322-49.000.

Glesser, Louis S. Portable blade sharpener. 4,640,058, Cl. 51-211.00R.

Goddard, John B., to U.S. Vanadium Corporation. Alkaline leaching of vanadium bearing residues. 4,640,823, Cl. 423-68.000.

Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., to Ashland Oil, Inc. Oxazoline/polyol/polyisocyanate polymers and process. 4,640,969, Cl. 528-73.000.

Goguen, Peter J., to Jones and Vining, Incorporated. Phosphorescent polymer-containing compositions and articles made therefrom. 4,640,797, Cl. 252-301.360.

Goins, Joan. Back brace having strap with widened middle portion for pad. 4,640,269, Cl. 128-78.000.

Goldstein, Vladimir, to Sunwell Engineering Company Limited. Refrigeration system. 4,640,100, Cl. 62-197.000.

Golledge, Ian: *See*—
Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., 4,640,485, Cl. 248-422.000.

Goodman, Lawrence A.: *See*—
Dolny, Gary M.; and Goodman, Lawrence A., 4,641,164, Cl. 357-23.400.

Goodworth, John P., II, to Donn Incorporated. Suspension ceiling system combining snap-up pans and lay-in panels. 4,640,064, Cl. 52-145.000.

Goossens, Laurentius M. J.; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., to U.S. Philips Corporation. Method of manufacturing an X-ray tube rotary anode and an X-ray tube rotary anode manufactured according to this method. 4,641,333, Cl. 378-144.000.

Gordon, Linda A.: *See*—
Dalling, N. Lawrence; and Gordon, Linda A., 4,640,686, Cl. 434-262.000.

Gordon, Lucas S.: *See*—
Balding, David P.; Hsu, Li-Chien; and Gordon, Lucas S., 4,640,819, Cl. 422-22.000.

Gorman, Mark D., to Armco Inc. High temperature ferritic steel. 4,640,722, Cl. 148-325.000.

Goss, Raymond W., to Hercules Incorporated. Precoat resin dispersion for tufted carpets. 4,640,953, Cl. 524-476.000.

Goto, Hajime; Amemiya, Ikuzo; Nakayama, Masanobu; and Hatano, Yoshinobu, to Kanagawa Mfg., Co., Ltd. Method of making quartz oscillators. 4,639,988, Cl. 29-25.350.

Goto, Naohisa: *See*—
Yokoyama, Yukio; Kimura, Katsuji; and Goto, Naohisa, 4,641,366, Cl. 455-89.000.

Goto, Yasuyuki: *See*—
Ogawa, Tetsuya; Kitano, Kisei; Goto, Yasuyuki; Fukui, Masahiro; and Sugimori, Shigeru, 4,640,795, Cl. 252-299.500.
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.

Gotou, Masakazu: *See*—
Motoyama, Shimesu; Gotou, Masakazu; Shirakawa, Hiromu; and Makino, Takamoto, 4,640,218, Cl. 118-19.000.

Gould, Alan P.: *See*—
McKibben, Kenneth D.; Gould, Alan P.; Groh, Craig J.; and Wuepper, Thomas E., 4,639,968, Cl. 15-304.000.

Goyarts, Wynand M., to Ingersoll-Rand Company. Slide bar mining bolting machine. 4,640,369, Cl. 173-42.000.

Grabiak, Raymond C.; Howe, Robert K.; and Schafer, David E., to Monsanto Company. 2-chloro-4-trifluoromethyl-thiazolecarbothioic acids useful as herbicidal safeners. 4,640,702, Cl. 71-90.000.

Gradl, Reinhard: *See*—
Schimmel, Gunther; and Gradl, Reinhard, 4,640,824, Cl. 423-185.000.

Graham, Neil A., to AE PLC. Oil cleaning assemblies for engines. 4,640,772, Cl. 210-295.000.

Gray, Robert R.; and Lindahl, Thomas G. Pulse jet combustor dehydration cone construction. 4,640,682, Cl. 432-58.000.

Green Bay Packaging Inc.: *See*—
Stacey, Ralph E., 4,640,456, Cl. 229-122.000.

Green, Gary J.; McVeigh, Harry A.; Penick, Joe E.; and Yan, Tsoung Y., to Mobil Oil Corporation. Method of burning low hydrogen content fuels. 4,640,675, Cl. 431-2.000.

Green, George D.; Laboe, Lauren M.; and Cook, Richard. Diagnostic device and method for examining the operation of a disk drive. 4,641,207, Cl. 360-55.000.

Green, Lanny A.; and Heck, Joaquim L., Jr., to United States of America, Energy. Fixture for supporting and aligning a sample to be analyzed in an X-ray diffraction apparatus. 4,641,329, Cl. 378-79.000.

Green, Robert, to Austin Rover Group Limited. Distributor for spark ignition internal combustion engine. 4,640,239, Cl. 123-146.50A.

Greenberg, Donald S. Seismic activated valve. 4,640,303, Cl. 137-38.000.

Greene, Franklin R.; Stern, Howard S.; and Waye, Jerome D., to E-Z-Em, Inc. Mouth guard for use with a diagnostic instrument. 4,640,273, Cl. 128-136.000.

Greene, George H.: *See*—
Ostrozynski, Robert L.; Greene, George H.; and Merrifield, James H., 4,640,962, Cl. 525-474.000.

Gregg, Jack P.: *See*—
Tunnell, George; Pomernacki, Charles L.; and Gregg, Jack P., 4,641,292, Cl. 367-198.000.

Gregg, James S.: *See*—
Mobley, Lawrence R.; and Gregg, James S., 4,640,414, Cl. 206-287.000.

Gregory, James N.: *See*—
Bodine, Albert G.; and Gregory, James N., 4,640,360, Cl. 166-286.000.

Gregotsch, Karl: *See*—
Ziegler, Gerhard; Gregotsch, Karl; and von Sivers, Rolf, 4,640,240, Cl. 123-193.00C.

Grein, Lutz; and Matthiensen, Gunter, to Leybold-Heraeus GmbH. Method of making a metal seal for flanged joints and a seal made by said method. 4,640,455, Cl. 228-176.000.

Greving, Gerhard; Hofgen, Gunther; and Zeitz, Rudiger, to International Standard Electric Corporation. TACAN beacon. 4,641,142, Cl. 342-399.000.

Grierson, Jeffrey G.; Jones, Carol A.; and Spears, William D., to Dow Chemical Company, The. Corrosion inhibition of metals in water systems using aminophosphonic acid derivatives in combination with manganese. 4,640,818, Cl. 422-15.000.

Griffin, Eric J.; Collier, Richard J.; and Hjipieris, George, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Six-port reflectometer. 4,641,082, Cl. 324-58.00B.

Grimsby, F. Norman, to Shell Oil Company. Process for the production of dichlorohydrin. 4,640,754, Cl. 204-182.400.

Grina, Larry D.: *See*—
Kapuscinski, Maria M.; Liu, Christopher S.; Hart, William P.; and Grina, Larry D., 4,640,788, Cl. 252-51.50R.

Grisar, Alexander: *See*—
Wolter, Albrecht; Hartmann, Rolf; Herchenbach, Horst; and Grisar, Alexander, 4,640,203, Cl. 110-346.000.

Grist, Warren W.; and Kelly, David L., to Burke Company, The. Waler corner lock assembly. 4,640,491, Cl. 249-219.00W.

Griston, Suzanne: *See*—
Hong, Ki C.; Griston, Suzanne; and Ault, Joseph W., 4,640,355, Cl. 166-269.000.

Groenhof, Eugene D.; Romenesko, David J.; and Streu, Rick D., to Dow Corning Corporation. Silicone brake fluid having reduced air solubility. 4,640,792, Cl. 252-78.300.

Groh, Craig J.: *See*—
McKibben, Kenneth D.; Gould, Alan P.; Groh, Craig J.; and Wuepper, Thomas E., 4,639,968, Cl. 15-304.000.

Grote, Albert J.; Tahim, Raghbir S.; and Chang, Kai, to TRW Inc. Local oscillator and mixer assembly. 4,641,369, Cl. 455-327.000.

Groupment d'Interet Economique Aerogenerateurs Carre: *See*—
Carre, Jean, 4,641,039, Cl. 290-44.000.

Grover, George M.; and Chrisman, Robert H., to Q-dot Corporation. Heat pipe. 4,640,347, Cl. 165-104.260.

Gruber, Gerhard: *See*—
Conrad, Ulrich; Moser, Peter; and Gruber, Gerhard, 4,640,256, Cl. 123-568.000.

Grumman Aerospace Corporation: *See*—
Kuless, Madeline A., 4,640,114, Cl. 72-22.000.

Gschwend, Hans: *See*—
Matt, Lukas; Mark, Fritz; and Gschwend, Hans, 4,640,452, Cl. 227-131.000.

GTE Communication Systems Corporation: *See*—
Reimer, William A., 4,641,224, Cl. 361-424.000.

GTE Products Corporation: *See*—
Horsch, Wilfried, 4,640,373, Cl. 175-272.000.

GTE Valeron: *See*—
Bhat, Deepak G.; Shah, Dhirajlal C.; Kyle, John R.; and Woerner, Paul F., 4,640,693, Cl. 51-295.000.

Guenther, Heinz, deceased: *See*—
Maier, Helmut; Storandt, Ralf; Guenther, Heinz, deceased; Guenther, Renate, legal representative; and Guenther, Sabine, legal representative, 4,640,051, Cl. 49-348.000.

Guenther, Renate, legal representative: *See*—
Maier, Helmut; Storandt, Ralf; Guenther, Heinz, deceased; Guenther, Renate, legal representative; and Guenther, Sabine, legal representative, 4,640,051, Cl. 49-348.000.

Guenther, Sabine, legal representative: *See*—
Maier, Helmut; Storandt, Ralf; Guenther, Heinz, deceased; Guenther, Renate, legal representative; and Guenther, Sabine, legal representative, 4,640,051, Cl. 49-348.000.

Gulf Canada Corporation: *See*—
Woods, H. John; and Souhrada, Frank, 4,640,762, Cl. 208-56.000.

Gullickson, M. Roy. Hay drying apparatus. 4,640,021, Cl. 34-15.000.

Gunji, Kunihiko: *See*—
Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, 4,641,211, Cl. 360-97.000.

Gur Optics and Systems, Ltd.: *See*—
Gur, Yehoshua, 4,641,182, Cl. 358-41.000.

Gur, Yehoshua, to Gur Optics and Systems, Ltd. Systems and components for detecting electromagnetic radiation and displaying images produced thereby. 4,641,182, Cl. 358-41.000.

Gyro-Flex Corporation: *See*—
Escher, James C., 4,640,508, Cl. 272-128.000.

Haage, Manfred: *See*—
Fischer, Artur; Onasch, Jurgen; and Haage, Manfred, 4,640,654, Cl. 411-55.000.

Habfast, Karl-Eugen; Kappus, Gunter; Rache, Horst; and Windel, Bernd. Process and apparatus for heating ionizing strips. 4,641,029, Cl. 250-288.000.

Habich, Adolph B.; and Hunt, Ronald E., to International Business Machines Corporation. Envelope hopper for feed and delivery. 4,640,502, Cl. 271-4.000.

Hackelsberger, Eberhard. Steam juice extractor. 4,640,186, Cl. 99-495.000.

Haener, Juan. Interlocking building block. 4,640,071, Cl. 52-286.000.

Hafele, Walter; Kramer, Manfred; Schmieder, Dietmar; and Warga, Johann, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,640,255, Cl. 123-495.000.

Haffer, Dieter, to Gebruder Kommerling Kunststoffwerke GmbH. Composite bar. 4,640,078, Cl. 52-731.000.

Haga, Toru: *See*—
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,640,707, Cl. 71-96.000.

Hagan, John: *See*—
Walter, Gerard S.; and Hagan, John, 4,640,571, Cl. 339-242.000.

Hagemann, Franz-Josef; and Hewing, Bernd. Floor board assembly. 4,640,067, Cl. 52-220.000.

Hagge, Douglas R.: *See*—
Boyles, William C.; Hagge, Douglas R.; and Johnston, Clifford V., 4,640,528, Cl. 280-789.000.

Hagino, Hideo: *See*—
Tajima, Osamu; Yamada, Makoto; Hagino, Hideo; and Nishizawa, Nobuyoshi, 4,640,873, Cl. 429-24.000.

Hahn, Alfred, to Siemens Aktiengesellschaft. Primary-beam collimator for stereo radiographic x-ray diagnostic apparatus. 4,641,335, Cl. 378-153.000.

Haines, Peter R., to M C G Plastics Limited. Screw caps for containers. 4,640,430, Cl. 215-330.000.

Halberg, Leslie I.: *See*—
Tykulsky, Alexander; Thiele, Karl E.; and Halberg, Leslie I., 4,640,292, Cl. 128-661.000.

Halbert, Joel M.; and Koen, Myron J., to Burr-Brown Corporation. Sampling waveform digitizer for dynamic testing of high speed data conversion components. 4,641,246, Cl. 364-487.000.

Halfman, Clarke J., to University of Health Sciences/The Chicago Medical School. Homogeneous fluorescence ligang binding assay based upon preferential alteration of the respective intensities of bound and free label by solvent components. 4,640,898, Cl. 436-546.000.

Hall, James W. Folding utility horse. 4,640,386, Cl. 182-155.000.

Hall, Mitchell A., to Monarch Tool & Manufacturing Company. Coin chute construction and method of making same. 4,640,405, Cl. 194-235.000.

Hall, Robert C.: *See*—
Hartle, Ronald J.; and Hall, Robert C., 4,640,310, Cl. 137-883.000.

Hall, Stephen, to Intalite International N.V. Clip for a suspended ceiling. 4,640,077, Cl. 52-665.000.

Hall Surgical-Division of Zimmer, Inc.: *See*—
Linden, Harry A., 4,641,076, Cl. 320-2.000.
Peterson, Drew, 4,639,980, Cl. 24-306.000.

Hall Surgical-Divison of Zimmer, Inc.: *See*—
Pascaloff, John H., 4,641,077, Cl. 320-2.000.

Halliburton Company: *See*—
Brothers, Lance E., 4,640,942, Cl. 523-130.000.
Smith, William H.; and Vinson, Edward F., 4,640,361, Cl. 166-288.000.

Hamasaki, Masafumi: *See*—
Yamaguchi, Tosinobu; Aitoh, Sigeru; and Hamasaki, Masafumi, 4,640,264, Cl. 126-263.000.

Hamilton, David M., Jr., to Shell Oil Company. Selective tricyclic hydrogenation and cracking process and catalyst suitable for such hydroconversion. 4,640,764, Cl. 208-110.000.

Hamilton, James W., Jr.; and Long, Edward A., to General Electric Co. Synchronous motor protection. 4,641,074, Cl. 318-706.000.

Hanada, Tool: *See*—
Nakada, Seiichi; Hanada, Tool; and Watanabe, Masao, 4,640,028, Cl. 38-77.700.

Hanayama, Masaru: *See*—
Matsumoto, Yukio; and Hanayama, Masaru, 4,640,863, Cl. 428-323.000.

Haneda, Satoshi: *See*—
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,641,200, Cl. 358-296.000.

Hanley, Michael: *See*—
Turner, Michael J. B.; Hanley, Michael; and Hartwell, Eric S., 4,640,231, Cl. 119-155.000.

Hansel, Paul H.: *See*—
Roberts, Ernest E.; Hansel, Paul H.; and Hudgens, William O., 4,640,734, Cl. 156-562.000.

Hansen, Otto D.; and Nielsen, Bent K. Method and a system for peeling crustaceans. 4,639,976, Cl. 17-48.000.

Hansen, Paul E.; and Marquardt, Susan K., to Minnesota Mining and Manufacturing Company. Inelastic, heat-elasticizable sheet material for diapers. 4,640,859, Cl. 428-105.000.

Hanssler, Gerd: *See*—
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, 4,640,923, Cl. 514-272.000.

Hanyuda, Toshiaki, to Showa Highpolymer Co. Ltd. Modified phenolic resin composition. 4,640,937, Cl. 522-31.000.

Harada, Osamu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, to Toyota Jidosha Kabushiki Kaisha. Method of discriminating octane number of fuel for motor vehicle. 4,640,251, Cl. 123-425.000.

Harara, Mitsuhiko: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.

Hards, John E., to Brunette Machine Works, Ltd. Sweep-data-responsive, high-speed, continuous-log-travel bucking apparatus. 4,640,160, Cl. 83-71.000.

Hare, John P.: *See*—
Akkerman, Neil H.; and Hare, John P., 4,640,350, Cl. 166-117.500.

Hargraves, John: *See*—
Kind, Stuart S.; Sanger, David G.; Twibell, John D.; and Hargraves, John, 4,640,035, Cl. 40-625.000.

Harris Corporation: *See*—
Heckaman, Douglas E.; Higman, Roger H.; and Frisco, Jeffrey A., 4,641,140, Cl. 342-371.000.
Rosback, Thomas J., 4,641,361, Cl. 381-103.000.
Harris, Jeremy M.: *See*—
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., 4,641,027, Cl. 250-237.00G.
Harris, Robert B., to S. C. Johnson & Son, Inc. Tarnish remover/metal polish formulation comprising a metal iodide, an acid, and water. 4,640,713, Cl. 106-3.000.
Harris, Ronald R.; and Ault, Russell L., to Owens-Corning Fiberglas Corporation. Structural member. 4,640,065, Cl. 52-204.000.
Harrison, Robert W. Dual-chambered oil changing container. 4,640,431, Cl. 220-1.00C.
Hart, William P.: *See*—
Kapuscinski, Maria M.; Liu, Christopher S.; Hart, William P.; and Grina, Larry D., 4,640,788, Cl. 252-51.50R.
Hartig, Franz; Fischer, Matthias; and Tomm, Dagwin, to Fichtel & Sachs AG. Clutch disc. 4,640,402, Cl. 192-106.200.
Hartkopf, Hans O.; and Zillmer, Adalbert, to Siemens Aktiengesellschaft. Computer-controlled interlocking system for a railway installation. 4,641,243, Cl. 364-436.000.
Hartle, Ronald J.; and Hall, Robert C., to Nordson Corporation. Variable air-piloted air regulator system. 4,640,310, Cl. 137-883.000.
Hartman, Murray: *See*—
Martin, Frank J.; Hartman, Murray; and Saunders, Randy, 4,640,985, Cl. 174-138.00F.
Hartman, Nile F.: *See*—
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., 4,641,027, Cl. 250-237.00G.
Hartmann, Albert: *See*—
Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, 4,640,911, Cl. 514-42.000.
Hartmann, Franz-Josef; and Hefendehl, Heinz, to Benteler-Werke AG. Straightening device. 4,640,115, Cl. 72-98.000.
Hartmann, Hans; and Kerschbaum, Ewald, to AKG Akustische u. Kino-Gerate GmbH. Acoustic frictional resistance construction and method of producing an acoustic frictional resistance using a laser. 4,640,382, Cl. 181-175.000.
Hartmann, Rolf: *See*—
Wolter, Albrecht; Hartmann, Rolf; Herchenbach, Horst; and Grisar, Alexander, 4,640,203, Cl. 110-346.000.
Hartwell, Eric S.: *See*—
Turner, Michael J. B.; Hanley, Michael; and Hartwell, Eric S., 4,640,231, Cl. 119-155.000.
Haruta, Masahiro: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.
Harvey Hubbell Incorporated: *See*—
Jorgensen, Robert W.; Lewis, Thomas E.; and Kesler, Gregory J., 4,640,433, Cl. 220-266.000.
Hasegawa, Akira, to Toyota Jidosha Kabushiki Kaisha. Steering mechanism of rack-and-pinion type. 4,640,148, Cl. 74-422.000.
Hasegawa, Akira: *See*—
Yoshida, Hiroshi; and Hasegawa, Akira, 4,639,981, Cl. 24-401.000.
Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Plywood. 4,640,857, Cl. 428-57.000.
Hasegawa, Satoshi, to NEC Corporation. System for carrying out spread spectrum communication through an electric power line. 4,641,322, Cl. 375-1.000.
Hasegawa, Yonosuke, to Pioneer Electronic Corporation. Community antenna television communication system. 4,641,363, Cl. 455-4.000.
Hashimoto, Akihiko: *See*—
Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, 4,641,215, Cl. 360-35.100.
Hashimoto, Masashi; Aratani, Matsuhiko; and Sawada, Kozo, to Fujisawa Pharmaceutical Co., Ltd. 1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid derivatives. 4,640,915, Cl. 514-210.000.
Hashiue, Masakazu; and Ogawa, Masashi, to Fuji Photo Film Co., Ltd. Supported medium for electrophoresis and supports therefor. 4,640,759, Cl. 204-299.00R.
Hashizume, Kiyozo: *See*—
Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, 4,640,608, Cl. 355-15.000.
Hashizume, Masao, to Kumahira Safe Co., Inc. Locking device for a door on safe or the like apparatus. 4,640,111, Cl. 70-314.000.
Hasircoglu, Alexander W., to Du Pont de Nemours, E. I., and Company. Ejecting latch for electrical connectors. 4,640,565, Cl. 339-45.00M.
Haswell, Walter T., Jr.; Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., to Crucible Materials Corporation. Method for producing clad tubular product. 4,640,814, Cl. 419-8.000.
Hata, Yoshitaka: *See*—
Abo, Toshimi; and Hata, Yoshitaka, 4,640,243, Cl. 123-399.000.
Hatakeyama, Yasuhiko; and Nagashima, Shigeo, to Hitachi, Ltd. Vector processor having pair process mode and single process mode. 4,641,275, Cl. 364-900.000.
Hatanai, Takashi: *See*—
Shimada, Yutaka; Hatanai, Takashi; Mukasa, Koichi; and Nakashima, Keishi, 4,641,213, Cl. 360-125.000.
Hatano, Yoshinobu: *See*—
Goto, Hajime; Amemiya, Ikuzo; Nakayama, Masanobu; and Hatano, Yoshinobu, 4,639,988, Cl. 29-25.350.
Hattori, Morihisa, to Nikko Kakouzai Co., Ltd. Adhesive pad for use on human body. 4,640,288, Cl. 128-505.000.
Hauni-Werke Korber & Co. KG.: *See*—
Komossa, Werner; Hausler, Nikolaus; and Elsner, Uwe, 4,640,059, Cl. 51-5.00D.
Haupl, Otmar, to Thyssen Industrie Aktiengesellschaft. Axle control mechanism for rail vehicles. 4,640,198, Cl. 105-168.000.
Hauser, Thomas M., to Mentor Corporation. Urine collection catheter. 4,640,688, Cl. 604-352.000.
Hausler, Nikolaus: *See*—
Komossa, Werner; Hausler, Nikolaus; and Elsner, Uwe, 4,640,059, Cl. 51-5.00D.
Hausman, Marvin S. Administration of "active" chondroitin sulfate A and "active" chondroitin sulfate C or mixtures thereof to mammals including humans. 4,640,912, Cl. 514-54.000.
Hayakawa, Masatoshi: *See*—
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.
Hayakawa, Takayuki: *See*—
Fujii, Hideji; Hayakawa, Takayuki; Sato, Shigeru; and Yanagihara, Eiichi, 4,640,729, Cl. 156-257.000.
Hayasaka, Akio: *See*—
Uehara, Keijiro; Higuchi, Hisayuki; and Hayasaka, Akio, 4,640,721, Cl. 148-188.000.
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, to Sony Corporation. Magnetic material having high permeability in the high frequency range. 4,640,871, Cl. 428-611.000.
Hayashi, Motomu; Nagai, Masayuki; and Akoshima, Shigeru, to Toyota Jidosha Kabushiki Kaisha. Vehicle window structure. 4,640,066, Cl. 52-208.000.
Hayden, Owen: *See*—
Dearden, Guy L.; and Hayden, Owen, 4,640,343, Cl. 165-70.000.
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, to Petroleum Fermentations N.V. Method for printed circuit board and/or printed wiring board cleaning. 4,640,719, Cl. 134-40.000.
Heamon, Mark L., to Swiss Aluminium Ltd. Filtration apparatus. 4,640,497, Cl. 266-227.000.
Heater, Thomas J.: *See*—
Martin, Robert A.; and Heater, Thomas J., 4,640,333, Cl. 164-246.000.
Martin, Robert A.; and Heater, Thomas J., 4,640,728, Cl. 156-245.000.
Hebert, Donald G., to DH Technology, Inc. High-speed wire print head with wire print position shift apparatus. 4,640,633, Cl. 400-124.000.
Heck, Joaquim L., Jr.: *See*—
Green, Lanny A.; and Heck, Joaquim L., Jr., 4,641,329, Cl. 378-79.000.
Heck, Samuel C.: *See*—
Bokmiller, David J.; and Heck, Samuel C., 4,640,638, Cl. 401-145.000.
Heckaman, Douglas E.; Higman, Roger H.; and Frisco, Jeffrey A., to Harris Corporation. Miniaturized microwave transmission link. 4,641,140, Cl. 342-371.000.
Heeger, Alan: *See*—
Wudl, Fred; Kobayashi, Masao; and Heeger, Alan, 4,640,748, Cl. 204-59.00R.
Hefendehl, Heinz: *See*—
Hartmann, Franz-Josef; and Hefendehl, Heinz, 4,640,115, Cl. 72-98.000.
Hefner, Robert E., Jr.; and Hunter, Douglas L., to Dow Chemical Company, The. Polyimido-ester compounds and thermoset resin compositions containing same. 4,640,957, Cl. 525-44.000.
Heidelberger Druckmaschinen AG: *See*—
Pfizenmaier, Wolfgang; Heidt, Heinrich; and Lehner, Rolf P., 4,641,070, Cl. 318-640.000.
Heidt, Heinrich: *See*—
Pfizenmaier, Wolfgang; Heidt, Heinrich; and Lehner, Rolf P., 4,641,070, Cl. 318-640.000.
Heimann GmbH: *See*—
Herwig, Thomas; and Geus, Georg, 4,641,330, Cl. 378-101.000.
Heinemann, Zoltan; and Konig, Heinz, to Chemie Linz Aktiengesellschaft. Process for the enhanced oil recovery of underground mineral oil deposits. 4,640,356, Cl. 166-272.000.
Heistand, Robert H., II: *See*—
Khoury, Issam A.; Heistand, Robert H., II; and Kohatsu, Iwao, 4,641,221, Cl. 361-321.000.
Heitzmann, Richard E.; Fitzgerald, Mark; and Sawyer, James L., to Lone Star Industries, Inc. Mineral binder and compositions employing the same. 4,640,715, Cl. 106-85.000.
Helbig, Klaus: *See*—
Gallion, Georg A.; Bratke, Dieter N.; Helbig, Klaus; and Reuter, Karl F., 4,640,450, Cl. 224-331.000.
Held, Kurt. Apparatus for the electrodeposition of a coating on an endless belt. 4,640,758, Cl. 204-272.000.
Helleur, Donald E. Method and apparatus for controlling the size of an opening through which a product is metered. 4,640,742, Cl. 162-212.000.
Helms, Georg: *See*—
Knodel, Gunter; and Helms, Georg, 4,640,141, Cl. 74-357.000.

Hemler, Paul F.; and Rohr, William A., to United States of America, Air Force. Hermetic chip carrier compliant soldering pads. 4,640,499, Cl. 267-160.000.

Henkel, Gunter, to N.V. Optimed. Method for manufacturing a spectacle lens for myopes. 4,640,587, Cl. 350-432.000.

Hennequin, Yves, to Jaeger. Device for measuring the level or volume of liquid in a tank. 4,641,122, Cl. 338-33.000.

Hentschel, Volker, to Hochtief Aktiengesellschaft vorm Gebr Helfmann. Apparatus for the construction of tunnels and shafts. 4,640,646, Cl. 405-141.000.

Heraud, Roger A.; and Amiel, Jacques, to Societe de Traitement Automatique—Controle et Etancheite "T R A C E" . Apparatus for leak testing at least one wall portion and/or a volume delimited by said wall portion, and a method of determining optimum parameters for said leak testing. 4,640,122, Cl. 73-49.200.

Herchenbach, Horst: *See*—
Steinbiss, Eberhard; Herchenbach, Horst; and Wolter, Albrecht, 4,640,681, Cl. 432-14.000.
Wolter, Albrecht; Hartmann, Rolf; Herchenbach, Horst; and Grisar, Alexander, 4,640,203, Cl. 110-346.000.

Hercules Incorporated: *See*—
Goss, Raymond W., 4,640,953, Cl. 524-476.000.

Hermann, John T., to Chrysler Motors Corporation. Quick hose connector. 4,640,535, Cl. 285-158.000.

Hernandez, Manolo, to De La Rue Giori S.A. Rotary multicolor machine for simultaneously printing both sides of a paper web or sheet. 4,640,189, Cl. 101-177.000.

Herrington, Fox J., to Mobil Oil Corporation. Substantially frictionless universal connecting device. 4,640,640, Cl. 403-57.000.

Herrscher, Albert: *See*—
Link, Helmut F.; Trautmann, Gunther; and Herrscher, Albert, 4,640,158, Cl. 82-3.000.

Herwig, Thomas; and Geus, Georg, to Heimann GmbH. High voltage supply circuit for an x-ray tube. 4,641,330, Cl. 378-101.000.

Hetemaa, Kalevi; Naumanen, Esko; and Vainio, Frans, to Elevator GmbH. Dual rails for roller pallets. 4,640,459, Cl. 238-122.000.

Hetterich, Hermann: *See*—
Brandenstein, Manfred; Hetterich, Hermann; and Horling, Peter, 4,640,632, Cl. 384-537.000.

Heumuller, Roland: *See*—
Kroning, Michael; Holzler, Georg; and Heumuller, Roland, 4,640,131, Cl. 73-600.000.

Hewing, Bernd: *See*—
Hagemann, Franz-Josef; and Hewing, Bernd, 4,640,067, Cl. 52-220.000.

Hewitt, Timothy W. Stand for a table saw. 4,640,326, Cl. 144-287.000.

Hewlett-Packard Company: *See*—
Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., 4,641,086, Cl. 324-77.00R.
Donecker, S. Bruce; Stewart, Ronald D.; and Frederick, Wayne L., 4,641,085, Cl. 324-77.00R.
Neuder, David L.; and Zellmer, Joel A., 4,641,348, Cl. 382-1.000.
Tykulsky, Alexander; Thiele, Karl E.; and Halberg, Leslie I., 4,640,292, Cl. 128-661.000.

Hicks, Raymond J.: *See*—
Brogdon, James W.; Allen, Kenneth D.; Barton, John S.; and Hicks, Raymond J., 4,640,153, Cl. 74-789.000.

Hicks, Roger J.; and Hufgard, John W., to Bessam-Aire, Inc. Apparatus for cleaning and conditioning gas. 4,640,696, Cl. 55-227.000.

Hieber, Konrad: *See*—
Neppl, Franz; Schwabe, Ulrich; and Hieber, Konrad, 4,640,844, Cl. 427-38.000.

Higashi, Haruki; Yashiki, Seiji; Waki, Kouichirou; and Kikuchi, Toshiyuki, to Mazda Motor Corporation. Lock-up control system for an automatic transmission. 4,640,394, Cl. 192-3.290.

Higashi, Nobuaki: *See*—
Asai, Eiichi; Tanaka, Hiroshi; and Higashi, Nobuaki, 4,641,267, Cl. 364-414.000.

Higashi, Sachio: *See*—
Nishino, Kenichi; Kobayashi, Atsuo; Higashi, Sachio; Yamamoto, Shinichiro; and Yasuda, Kiyoshi, 4,640,950, Cl. 524-265.000.

Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, to Ricoh Co., Ltd. Cleaning method for use in electrophotography. 4,640,608, Cl. 355-15.000.

Higman, Roger H.: *See*—
Heckaman, Douglas E.; Higman, Roger H.; and Frisco, Jeffrey A., 4,641,140, Cl. 342-371.000.

Higuchi, Hisayuki: *See*—
Uehara, Keijiro; Higuchi, Hisayuki; and Hayasaka, Akio, 4,640,721, Cl. 148-188.000.

Hilbrink, Johan O., to NCR Corporation. Field effect display system with diode selection of picture elements. 4,641,135, Cl. 340-784.000.

Hill, Joe W. Electrical outlet faceplate with locking closures. 4,640,564, Cl. 339-40.000.

Hill, Stephen E.: *See*—
Kelly, Patrick S.; Oswald, Thomas; Jeal, Alan J.; Hill, Stephen E.; and Murphy, Robert, 4,641,372, Cl. 455-601.000.

Hill, William D.: *See*—
Sawyer, Steven D.; Hill, William D.; Wilson, Patricia A.; and Steiner, William M., 4,640,812, Cl. 376-245.000.

Hillary, Christopher J.: *See*—
Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., 4,640,485, Cl. 248-422.000.

Hillig, William B.; and Musikant, Solomon, to General Electric Company. Mullite matrix composite. 4,640,899, Cl. 501-5.000.

Hillig, William B.; and Musikant, Solomon, to General Electric Company. Mullite by reactive hot pressing. 4,640,904, Cl. 501-128.000.

Hilti Aktiengesellschaft: *See*—
Matt, Lukas; Mark, Fritz; and Gschwend, Hans, 4,640,452, Cl. 227-131.000.

Himmel, Jorg: *See*—
Bonfig, Karl-Walter; Himmel, Jorg; and Kuipers, Ulrich, 4,641,120, Cl. 337-242.000.

Hinn, Werner, to RCA Corporation. Kinescope driver in a digital video signal processing system. 4,641,194, Cl. 358-242.000.

Hinrichs, Walter: *See*—
Bittner, Friedrich; Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; and Splett, Erich, 4,640,832, Cl. 423-562.000.

Hintsch, Otto; and Ernst, Hanspeter, to Sulzer Brothers Limited. Catcher for a weaving machine. 4,640,318, Cl. 139-439.000.

Hinzpeter, Jurgen, to Wilhelm Fette GmbH. Device for testing, in particular of tablets by weighing. 4,640,376, Cl. 177-50.000.

Hirabayashi, Hiromitsu; and Sakurai, Masaaki, to Canon Kabushiki Kaisha. Fixing device. 4,640,600, Cl. 355-3.0FU.

Hirai, Hiroyuki: *See*—
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, 4,640,892, Cl. 430-617.000.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,640,891, Cl. 430-551.000.

Hiraki, Sei: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.

Hirakushi, Shuzo: *See*—
Daido, Toshihiko; Matsubara, Hideo; and Hirakushi, Shuzo, 4,640,380, Cl. 180-141.000.

Hirao, Toshiyuki: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.

Hirasawa, Kotaro: *See*—
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.

Hirata, Tadashi: *See*—
Mochida, Kenichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, 4,640,919, Cl. 514-241.000.

Hiratsuka, Seiichiro: *See*—
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,641,200, Cl. 358-296.000.

Hirose Manufacturing Co., Ltd.: *See*—
Hirose, Tokuzo; and Inoue, Ikuo, 4,641,118, Cl. 335-282.000.

Hirose, Tokuzo; and Inoue, Ikuo, to Hirose Manufacturing Co., Ltd. Electromagnet and electromagnetic valve coil assemblies. 4,641,118, Cl. 335-282.000.

Hiroshi, Yokouchi, to OKI Electric Industry Co., Ltd. CMOS crystal controlled oscillator. 4,641,109, Cl. 331-116.0FE.

Hiroshima, Tatsuo: *See*—
Sakamoto, Takahide; Hiroshima, Tatsuo; Matsubara, Noriyuki; and Miyata, Kenichi, 4,641,092, Cl. 324-227.000.

Hirota, Mitsuhiko: *See*—
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,641,069, Cl. 318-625.000.

Hirota, Tatsuya: *See*—
Suzuki, Masami; Hirota, Tatsuya; and Maeda, Masahiko, 4,640,022, Cl. 34-48.000.

Hitachi Koki Co., Ltd.: *See*—
Kataoka, Keiji; and Saito, Susumu, 4,640,573, Cl. 350-6.100.

Hitachi, Ltd.: *See*—
Fujii, Hideji; Hayakawa, Takayuki; Sato, Shigeru; and Yanagihara, Eiichi, 4,640,729, Cl. 156-257.000.
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.
Hatakeyama, Yasuhiko; and Nagashima, Shigeo, 4,641,275, Cl. 364-900.000.
Inoue, Fumio; Eto, Masahiro; Shimaoka, Shoei; and Sakai, Noboru, 4,641,195, Cl. 358-242.000.
Kataoka, Keiji; and Saito, Susumu, 4,640,573, Cl. 350-6.100.
Kawanishi, Tsuneaki; Mori, Yasuki; Noguchi, Koji; and Iimura, Tsutomu, 4,640,880, Cl. 430-106.600.
Kimura, Katsutaka; Hori, Ryoichi; Ito, Kiyoo; and Sunami, Hideo, 4,641,279, Cl. 365-149.000.
Konishi, Yozo; Akashi, Kichizo; Watase, Hideo; and Yoshioka, Tatsuo, 4,641,271, Cl. 364-478.000.
Niinomi, Tatsuya; and Kikuchi, Hiroshi, 4,640,663, Cl. 414-730.000.
Nitta, Yoshihiko; Okajima, Atsushi; and Yamano, Fumiyuki, 4,641,264, Cl. 364-900.000.
Sasaki, Yukio; Nishimura, Kotaro; and Minato, Osamu, 4,641,285, Cl. 365-210.000.
Suzaki, Masafumi; Mikami, Katsumasa; Nagano, Yousuke; and Kitagishi, Tomoji, 4,641,149, Cl. 346-76.0PH.
Uehara, Keijiro; Higuchi, Hisayuki; and Hayasaka, Akio, 4,640,721, Cl. 148-188.000.
Watanabe, Masayoshi, 4,641,297, Cl. 369-75.200.
Yabushita, Masaharu; Nohmi, Makoto; Fujikura, Nobuyuki; Miyamoto, Shoji; and Ihara, Hirokazu, 4,641,237, Cl. 364-200.000.
Yata, Kiyoshi; and Sawada, Hideo, 4,641,277, Cl. 364-900.000.

Yoshioka, Masahiro; and Tsubouchi, Haruyoshi, 4,640,630, Cl. 384-129.000.
Hitachi Medical Corporation: *See—*
Fujii, Hideji; Hayakawa, Takayuki; Sato, Shigeru; and Yanagihara, Eiichi, 4,640,729, Cl. 156-257.000.
Hitachi Metals Co., Ltd.: *See—*
Kawanishi, Tsuneaki; Mori, Yasuki; Noguchi, Koji; and Iimura, Tsutomu, 4,640,880, Cl. 430-106.600.
Hjipieris, George: *See—*
Griffin, Eric J.; Collier, Richard J.; and Hjipieris, George, 4,641,082, Cl. 324-58.00B.
Håkansson, Bengt E. W. Adjustable fastening device. 4,640,550, Cl. 297-483.000.
Hochtief Aktiengesellschaft vorm Gebr Helfmann: *See—*
Hentschel, Volker, 4,640,646, Cl. 405-141.000.
Hoechst Aktiengesellschaft: *See—*
Blickle, Peter, 4,640,750, Cl. 204-79.000.
Richter, Wolfgang; and Durl, Bernd, 4,640,691, Cl. 8-543.000.
Rosner, Manfred; and Raether, Wolfgang, 4,640,917, Cl. 514-222.000.
Schimmel, Gunther; and Gradl, Reinhard, 4,640,824, Cl. 423-185.000.
Hoek, Cornelis; and van Ditten, Jurjen L., to N.V. W.A. Hoek's Machine. Gas cylinder identification device. 4,640,031, Cl. 40-306.000.
Hoffman, Dwight K.: *See—*
Fisk, Thomas E.; and Hoffman, Dwight K., 4,640,935, Cl. 521-137.000.
Hoffman, Gary J.: *See—*
Wallick, William P.; and Hoffman, Gary J., 4,640,187, Cl. 99-538.000.
Hoffman, Robert K.; Kavanaugh, Mark A.; and Franson, David C., to Parker Hannifin Corporation. Pilot operated poppet valve with speed control. 4,640,309, Cl. 137-596.180.
Hoffmann-La Roche Inc.: *See—*
Kompis, Ivan; and Weiss, Ekkehard, 4,640,918, Cl. 514-222.000.
Mohacsi, Erno; and O'Brien, Jay P., 4,640,930, Cl. 514-431.000.
Hofgen, Gunther: *See—*
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Hofmann, Hans J., to Schwan-Stabilo Schwanhausser GmbH & Co. Powder stick with shrink film sheathing. 4,640,636, Cl. 401-96.000.
Hofstatter, Alfred F.: *See—*
Lichti, Wayne P.; and Hofstatter, Alfred F., 4,640,711, Cl. 75-248.000.
Hogan, Dennis R.; and Wright, John K. Security and fire protection system. 4,641,127, Cl. 379-40.000.
Hogg, John A. Apparatus for comb honey. 4,639,962, Cl. 6-2.00R.
Hohmann, Thomas, to Honeywell GmbH. Apparatus for simulation of visual fields of view. 4,641,255, Cl. 364-522.000.
Holland, George E.; Struve, Walter S.; and Homer, John F., to Iowa State University Research Foundation, Inc. Real time speech formant analyzer and display. 4,641,343, Cl. 381-48.000.
Holman, Robert L., to Xerox Corporation. Wave guide fabrication method. 4,640,736, Cl. 156-603.000.
Holmes, Myron L.; and Smolensky, Leo A., to Combustion Engineering, Inc. Fluidized bed combustor having integral solids separator. 4,640,201, Cl. 110-245.000.
Holmes, Terry L.: *See—*
Anderson, James E.; and Holmes, Terry L., 4,640,219, Cl. 118-24.000.
Holtman, Lodewijk T., to Oce-Nederland B.V. Conveyor for sheet material. 4,640,409, Cl. 198-624.000.
Holzapfel, Klaus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Coaxial shaft connection for a printing machine cylinder. 4,640,190, Cl. 101-348.000.
Holzler, Georg: *See—*
Kroning, Michael; Holzler, Georg; and Heumuller, Roland, 4,640,131, Cl. 73-600.000.
Homer, John F.: *See—*
Holland, George E.; Struve, Walter S.; and Homer, John F., 4,641,343, Cl. 381-48.000.
Honda Giken Kogyo K.K.: *See—*
Ozawa, Motoo, 4,640,341, Cl. 165-41.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Koike, Yuzuru; Koike, Akihiko; and Ueno, Masayuki, 4,640,244, Cl. 123-339.000.
Nishimura, Sadanori; and Sekine, Noboru, 4,640,393, Cl. 192-0.052.
Nishimura, Sadanori, 4,640,396, Cl. 192-331.000.
Ohishi, Toshio; and Kurotobi, Yohji, 4,640,698, Cl. 55-502.000.
Saito, Gunji, 4,640,366, Cl. 172-42.000.
Honda, Junichi: *See—*
Koiwai, Sakae; Asaoka, Keizo; Shirasawa, Katsuhiko; Watanabe, Hiroyuki; and Honda, Junichi, 4,640,001, Cl. 29-572.000.
Honeywell GmbH: *See—*
Hohmann, Thomas, 4,641,255, Cl. 364-522.000.
Honeywell Inc.: *See—*
Adams, John T.; and Bohan, John E., Jr., 4,641,043, Cl. 307-117.000.
Alfors, Eugene D., 4,641,003, Cl. 200-332.000.
Honeywell Information Systems Inc.: *See—*
Joyce, Thomas F.; and Kelly, Richard P., 4,641,305, Cl. 371-12.000.
Hong, Ki C.; Griston, Suzanne; and Ault, Joseph W., to Chevron Research Company. Limited entry method for multiple zone, compressible fluid injection. 4,640,355, Cl. 166-269.000.
Hongo, Yusuo; and Nitta, Yoshio, to Fuji Electric Co., Ltd. Pattern recognition apparatus. 4,641,355, Cl. 382-34.000.
Honma, Toshio, to Canon Kabushiki Kaisha. Copying apparatus. 4,640,603, Cl. 355-3.00R.
Hood, Craig C.: *See—*
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, 4,640,719, Cl. 134-40.000.
Hoover, Wilbur G.: *See—*
Whalen, Charles E.; and Hoover, Wilbur G., 4,640,771, Cl. 210-167.000.
Hopfenextraktion HVG Barth, Raiser & Co.: *See—*
Forster, Adrian; and Gehrig, Manfred, 4,640,841, Cl. 426-425.000.
Hopper, Laurence E.: *See—*
Cosson, Colin; and Hopper, Laurence E., 4,640,188, Cl. 101-39.000.
Hori, Ryoichi: *See—*
Kimura, Katsutaka; Hori, Ryoichi; Ito, Kiyoo; and Sunami, Hideo, 4,641,279, Cl. 365-149.000.
Horiguchi, Fumio, to Kabushiki Kaisha Toshiba. High-density semiconductor memory device with charge-coupling memory cells. 4,641,280, Cl. 365-183.000.
Horiuchi, Yushi: *See—*
Mori, Masaaki; Sano, Akira; Horiuchi, Yushi; and Okumura, Yoshihiro, 4,640,023, Cl. 34-57.00A.
Horling, Peter: *See—*
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Hornblad, Richard P.; and Sorensen, Gerald R., to DCI Marketing. Mobius strip and display utilizing the same. 4,640,029, Cl. 40-5.000.
Horsch, Wilfried, to GTE Products Corporation. Bore head for deep-hole boring. 4,640,373, Cl. 175-272.000.
Hosaka, Akio; and Yamamoto, Akito, to Nissan Motor Company, Limited. Method and apparatus for engine knock level control. 4,640,250, Cl. 123-425.000.
Hosen Printing Co., Ltd.: *See—*
Watanabe, Yuki; and Tozaki, Hiroshi, 4,640,612, Cl. 355-87.000.
Hoshikawa, Jun; and Iwashita, Yukihiro, to Kabushiki Kaisha Seiko Epson. Display panel having an inner and an outer seal and process for the production thereof. 4,640,583, Cl. 350-343.000.
Hoshikawa, Katsuyuki: *See—*
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 4,640,329, Cl. 152-209.00R.
Hoshino Gakki Co., Ltd.: *See—*
Hoshino, Yoshihiro, 4,640,175, Cl. 84-421.000.
Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Support leg for bass drum. 4,640,175, Cl. 84-421.000.
Hoskins, John T.; Zillig, Steven R.; and Caroll, James E., to Hoskins, John T.; and Zillig, Robert G. Fluid coupling assembly. 4,640,534, Cl. 285-158.000.
Hoskins Limited: *See—*
Speed, Philip, 4,639,954, Cl. 5-63.000.
Hougaard, Finn: *See—*
Rasmussen, Vagn N.; and Hougaard, Finn, 4,640,610, Cl. 355-73.000.
Hovestadt, Herbert: *See—*
Bittner, Friedrich; Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; and Splett, Erich, 4,640,832, Cl. 423-562.000.
Howaldtswerke-Deutsche Werft, Aktiengesellschaft: *See—*
Lehmann, Eike; and Jannusch, Reiner, 4,640,216, Cl. 114-340.000.
Howard, Bruce A.: *See—*
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Howard, William R. Combination rope guard and rope bundle keeper. 4,639,977, Cl. 24-16.00R.
Howe, Arthur T., to Standard Oil Company (Indiana). Amorphous carbon electrodes and their use in electrochemical cells. 4,640,744, Cl. 204-1.00R.
Howe, Robert K.: *See—*
Grabiak, Raymond C.; Howe, Robert K.; and Schafer, David E., 4,640,702, Cl. 71-90.000.
Howell, Richard J. Bicycle pedalling apparatus. 4,640,151, Cl. 74-594.600.
Hoya Corporation: *See—*
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,640,699, Cl. 65-3.150.
Hoyle, Charles E.: *See—*
Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., 4,640,885, Cl. 430-197.000.
Hsu, Li-Chien: *See—*
Balding, David P.; Hsu, Li-Chien; and Gordon, Lucas S., 4,640,819, Cl. 422-22.000.
Hsu, Sheng-Hsiung, to Nestec S.A. Agglomeration process. 4,640,839, Cl. 426-285.000.
Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Gas control device for controlling the fuel gas and oxidizing agent supply to a burner in an atomic absorption spectrometer. 4,640,677, Cl. 431-89.000.
Huber, Wolfgang: *See—*
Schiele, August; and Huber, Wolfgang, 4,640,181, Cl. 89-46.000.
Hudd, Anthony W.: *See—*
Clark, Peter J.; Hudd, Anthony W.; Bloor, Stephen T.; and Roller, Erling, 4,640,335, Cl. 164-440.000.
Hudgens, William O.: *See—*
Roberts, Ernest E.; Hansel, Paul H.; and Hudgens, William O., 4,640,734, Cl. 156-562.000.
Huebler, James E.: *See—*
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Hufgard, John W.: *See*—
Hicks, Roger J.; and Hufgard, John W., 4,640,696, Cl. 55-227.000.
Huggins, Hal A.: *See*—
Pearman, Bruce W.; and Huggins, Hal A., 4,641,089, Cl. 324-103.00P.
Hughes Aircraft Company: *See*—
McGowan, George A.; and Kaplan, Robert L., 4,641,288, Cl. 367-20.000.
Hughes, Norman S.; and Doyle, Walter M., to Laser Precision Corporation. Spectrometers having purge retention during sample loading. 4,640,617, Cl. 356-326.000.
Hughes, Victor B., to Shell Oil Company. Expandable fibrous bed coalescer. 4,640,781, Cl. 210-520.000.
Hughes, William C., to General Electric Company. Receiver for phase shift modulated carrier signals. 4,641,325, Cl. 375-97.000.
Humphrey Instruments, Inc.: *See*—
Humphrey, William E., 4,640,596, Cl. 351-211.000.
Humphrey, William E., to Humphrey Instruments, Inc. Objective refractor for the eye. 4,640,596, Cl. 351-211.000.
Hunnel, Larry B.: *See*—
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., 4,640,438, Cl. 220-359.000.
Hunt, Ronald E.: *See*—
Habich, Adolph B.; and Hunt, Ronald E., 4,640,502, Cl. 271-4.000.
Hunter, Douglas L.: *See*—
Hefner, Robert E., Jr.; and Hunter, Douglas L., 4,640,957, Cl. 525-44.000.
Hunter, William H.: *See*—
Ross, Frank E.; and Hunter, William H., 4,641,006, Cl. 219-10.55F.
Hutchins, Derek R.: *See*—
Zebedee, Alan R.; and Hutchins, Derek R., 4,640,052, Cl. 49-383.000.
Hutchison, Victor E.: *See*—
Wilson, Monti R.; Hutchison, Victor E.; Bendure, William J.; and Anderson, Frederick W., 4,641,244, Cl. 364-475.000.
Hwang, Chong S. Dental drilling assembly. 4,640,684, Cl. 433-110.000.
Hy-Lite Mfg. Co., Inc.: *See*—
Spellman, Francis T., Jr., 4,640,662, Cl. 414-642.000.
Hydorn, Ronald. Apparatus and method for replacing bearings in a walking beam in trucks and trailers having tandem axles. 4,640,007, Cl. 29-709.000.
Iba, Yoichi; Kimura, Tadashi; and Kajitani, Kazuo, to Olympus Optical Co., Ltd. Objective for a binocular stereomicroscope. 4,640,586, Cl. 350-414.000.
Ichikawa, Yoshinori: *See*—
Shigemasa, Takashi; and Ichikawa, Yoshinori, 4,641,235, Cl. 364-149.000.
Ichinoi, Yutaka; and Nishimoto, Naomichi, to Victor Company of Japan, Ltd. Color video signal transmitting apparatus. 4,641,201, Cl. 358-310.000.
Ichitoh, Toshikatsu: *See*—
Kato, Shigeru; Osada, Naomi; Ichitoh, Toshikatsu; Murata, Masae; and Mochizuki, Masfumi, 4,641,151, Cl. 346-76.0PH.
Ichiyanagi, Takashi: *See*—
Imanishi, Kiyokazu; Naka, Hiroyuki; Sakurai, Yasuo; Ichiyanagi, Takashi; and Kishimoto, Masaru, 4,641,214, Cl. 360-130.240.
ICI Australia Limited: *See*—
Bird, Graham J.; Farquharson, Graeme J.; and Watson, Keith G., 4,640,708, Cl. 71-98.000.
Ida, Masatoshi: *See*—
Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, 4,641,215, Cl. 360-35.100.
Idemitsu Kosan Company Limited: *See*—
Matsuo, Shigeru; and Murakami, Tomoyoshi, 4,640,974, Cl. 528-211.000.
Matsuo, Shigeru; and Murakami, Tomoyoshi, 4,640,975, Cl. 528-211.000.
Identicolor International, Inc.: *See*—
Evans, Robert; and Evans, Robert, Jr., 4,640,878, Cl. 430-15.000.
IDN Inventions and Development of Novelties AG: *See*—
Ackeret, Peter, 4,640,415, Cl. 206-387.000.
IFR, Inc.: *See*—
Selim, Harold N., 4,641,101, Cl. 328-25.000.
Igarashi, Michiko: *See*—
Shimizu, Kimihiro; Nakahara, Tsuguji; Kinoshita, Taketoshi; Takatsuka, Jun; and Igarashi, Michiko, 4,640,835, Cl. 424-94.000.
Igarashi, Yuriko: *See*—
Okada, Yoshio; and Igarashi, Yuriko, 4,640,847, Cl. 427-150.000.
Igloo Corporation: *See*—
Decker, Joseph A., Jr.; Fiore, Joseph F., Jr.; and Katz, Stanley A., 4,640,392, Cl. 190-108.000.
Ihara, Hirokazu: *See*—
Yabushita, Masaharu; Nohmi, Makoto; Fujikura, Nobuyuki; Miyamoto, Shoji; and Ihara, Hirokazu, 4,641,237, Cl. 364-200.000.
Iimura, Tsutomu: *See*—
Kawanishi, Tsuneaki; Mori, Yasuki; Noguchi, Koji; and Iimura, Tsutomu, 4,640,880, Cl. 430-106.600.
Iizawa, Ryuji; and Murakami, Koji, to Fujitsu Limited; and Aisin Seiki Kabushiki Kaisha. Motor control method and apparatus therefor. 4,641,067, Cl. 318-287.000.
Iizuka, Tetsuya; Fujii, Syuso; and Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Dynamic memory device with an RC circuit for inhibiting the effects of alpha particle radiation. 4,641,165, Cl. 357-23.600.
Ikeda, Kazushige: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 4,640,329, Cl. 152-209.00R.
Ikedo, Yuji; and Okajima, Takahiro, to Pioneer Electronic Corporation. Auto loading disc player. 4,641,298, Cl. 369-77.100.
Ilco Unican Corp.: *See*—
Fish, Aaron M.; Mazoff, Stanley S.; D'Intino, Adamo M.; and Somasundaram, Hariharan, 4,640,110, Cl. 70-269.000.
Imai, Hiroshi: *See*—
Kasai, Junichi; and Imai, Hiroshi, 4,641,344, Cl. 381-57.000.
Imaizumi, Haruo; and Kobayashi, Satoru, to Junkosha Company, Ltd. Leak detecting device. 4,640,123, Cl. 73-61.10R.
Imaki, Katsuhiro; Okegawa, Tadao; and Arai, Yoshinobu, to Ono Pharmaceutical Co., Ltd. 3-(indian-5-yloxy (or thio)) cyclopentanecarboxylic acid analogues. 4,640,931, Cl. 514-510.000.
Imamura, Mineo: *See*—
Nagai, Takaatsu; Takada, Masayuki; Sato, Akira; and Imamura, Mineo, 4,641,319, Cl. 373-84.000.
Imanishi, Kiyokazu; Naka, Hiroyuki; Sakurai, Yasuo; Ichiyanagi, Takashi; and Kishimoto, Masaru, to Matsushita Electric Industrial Co., Ltd. Rotary head assembly with pump-out type spiral grooves for more stable tape running. 4,641,214, Cl. 360-130.240.
IMI Kynoch Limited: *See*—
Carter, George B.; and Manby, Alan P., 4,640,724, Cl. 149-109.600.
IMI Refiners Ltd.: *See*—
Clark, Peter J.; Hudd, Anthony W.; Bloor, Stephen T.; and Roller, Erling, 4,640,335, Cl. 164-440.000.
Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte: *See*—
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.
Impey, Thomas T. Double disc gate valve. 4,640,302, Cl. 137-15.000.
Ina, Hideki: *See*—
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Inaguma, Yukio: *See*—
Asano, Katsuhiro; Inaguma, Yukio; and Iwama, Norio, 4,641,075, Cl. 318-811.000.
Inamori, Mikio: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, 4,640,210, Cl. 112-456.000.
Inamoto, Kiyoshi, to Sharp Kabushiki Kaisha. Corona discharger for separating copy paper from photoreceptor in electrophotographic copying machine. 4,640,606, Cl. 355-14.0TR.
Inatsuki, Kenichi, to Fuji Photo Film Co., Ltd. Automatic notcher with judging device for film frames to be printed. 4,641,019, Cl. 250-201.000.
Inazawa, Keichi: *See*—
Fukuroi, Takeo; and Inazawa, Keichi, 4,639,983, Cl. 24-689.000.
Inazawa, Yoshizumi; Takahashi, Toshihiko; Tani, Toshiyuki; and Satomura, Shigeyuki, to Sony Corporation. Recording/reproducing apparatus. 4,641,208, Cl. 360-72.200.
Indal, Inc.: *See*—
Rushford, Calvin R., 4,640,046, Cl. 49-44.000.
Indescor Hydrodynamics Inc.: *See*—
Puchala, Ryszard J.; and Miko, Stephen J., 4,640,644, Cl. 404-75.000.
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Ingersoll-Rand Company: *See*—
Goyarts, Wynand M., 4,640,369, Cl. 173-42.000.
Inoue, Fumio; Eto, Masahiro; Shimaoka, Shoei; and Sakai, Noboru, to Hitachi, Ltd. Scanning speed modulating apparatus for television receiver. 4,641,195, Cl. 358-242.000.
Inoue, Ikuo: *See*—
Hirose, Tokuzo; and Inoue, Ikuo, 4,641,118, Cl. 335-282.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,641,251, Cl. 364-513.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Robot. 4,641,251, Cl. 364-513.000.
Inoue, Masuo: *See*—
Terano, Minoru; Yokoyama, Yasushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,640,906, Cl. 502-104.000.
Inoue, Yasuhiro: *See*—
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Institut Francais de Recherche pour l'Exploitation de la Mer - IFREMER: *See*—
Blancheton, Jean-Paul; Calvas, Jacques; Michel, Alain H.; and Vonau, Vincent, 4,640,227, Cl. 119-2.000.
Institut Pasteur: *See*—
Leynadier, Francisque; and Luce, Herve , 4,640,897, Cl. 436-501.000.
Institut Prikladnoi Fiziki Akademii Nauk Belorusskoi SSR: *See*—
Melgui, Mikhail A.; and Sandomirsky, Sergei G., 4,641,093, Cl. 324-239.000.
Institut Straumann AG: *See*—
Comte, Pierre-Andre, 4,640,983, Cl. 174-119.00R.
Institute of Gas Technology: *See*—
Rush, William F.; Huebler, James E.; and Lysenko, Peter, 4,641,377, Cl. 381-111.000.

Instrumentarium Corp.: *See*—
Gastrin, Jan, 4,641,336, Cl. 378-156.000.

Instytut Gornictwa Naftowego i Gazownictwa: *See*—
Dzwinel, Jan, 4,641,100, Cl. 324-330.000.

Insul Company, Inc.: *See*—
LaBate, Micheal D.; and Perri, Joseph, 4,640,498, Cl. 266-272.000.

Intalite International N.V.: *See*—
Hall, Stephen, 4,640,077, Cl. 52-665.000.

International Business Machines Corporation: *See*—
Alnot, Patrick R.; Auerbach, Daniel J.; Brundle, Christopher R.; and Miller, Dolores C., 4,640,718, Cl. 134-2.000.
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,640,221, Cl. 118-689.000.
Bryan, Barry L.; Druckerman, Martin; McDowell, Allen W.; Schneider, Ira H.; and Newkirk, Gary L., 4,641,262, Cl. 364-900.000.
Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., 4,640,485, Cl. 248-422.000.
Dyer, Stanley; Molloy, James J.; Nguyen, Thoi; Riherd, David M.; Voit, William F., Jr.; and West, Donald L., 4,641,148, Cl. 346-76.0PH.
Fredericks, Edward C.; and Nanda, Madan M., 4,640,738, Cl. 156-656.000.
Habich, Adolph B.; and Hunt, Ronald E., 4,640,502, Cl. 271-4.000.
Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Shepard, Joseph F., 4,641,170, Cl. 357-35.000.
Satoh, Junichi, 4,641,357, Cl. 382-61.000.
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International Computers Limited: *See*—
Russell, Brian M., 4,641,307, Cl. 370-60.000.

International Glide Mfg. Corp.: *See*—
Neville, Donald G., 4,640,486, Cl. 248-425.000.

International Minerals & Chemical Corp.: *See*—
Baumann, Arthur N., 4,640,828, Cl. 423-321.00R.

International Standard Electric Corporation: *See*—
Dean, Andrew, 4,641,375, Cl. 455-607.000.
Greving, Gerhard; Hofgen, Gunther; and Zeitz, Rudiger, 4,641,142, Cl. 342-399.000.
Sodergard, Bengt, 4,640,666, Cl. 415-121.00B.
Van Simaeys, Francoise C. G.; Leurs, Anna M. C.; Upp, Daniel C.; Lawrence, Alan J.; and Cotton, John M., 4,641,301, Cl. 370-58.000.
Whittaker, Edward J. W., 4,640,993, Cl. 379-383.000.

Intersil, Inc.: *See*—
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Inui, Takayasu: *See*—
Matsuda, Yukinobu; and Inui, Takayasu, 4,640,245, Cl. 123-339.000.

Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Solid-state image pickup device with selective output characteristics and imaging apparatus using same. 4,641,169, Cl. 357-30.000.

Inuiya, Masafumi: *See*—
Ohta, Takahiro; Inuiya, Masafumi; and Fujimura, Ikuo, 4,641,198, Cl. 358-285.000.

Inukai, Satoshi: *See*—
Taki, Yoshihiro; Akado, Hajime; Fumae, Keizo; and Inukai, Satoshi, 4,640,779, Cl. 210-493.500.

Iowa State University Research Foundation, Inc.: *See*—
Holland, George E.; Struve, Walter S.; and Homer, John F., 4,641,343, Cl. 381-48.000.

Irie, Toshio; Kyono, Kazuaki; Kimura, Hajime; and Kurokawa, Shigeo, to Kawasaki Steel Corporation. Corrosion-resistant steel strip having Zn-Fe-P alloy electroplated thereon. 4,640,872, Cl. 428-659.000.

Irvine, Robert: *See*—
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, 4,640,506, Cl. 271-212.000.

Irving, Edward: *See*—
Banks, Christopher P.; and Irving, Edward, 4,640,753, Cl. 204-181.700.

Irwin, Robert S., to Du Pont de Nemours, E. I., and Company. Filament of polyimide from pyromellitic acid dianhydride and 3,4'-oxydianiline. 4,640,972, Cl. 528-188.000.

Isaacson, Philip O., to Aequitron Medical, Inc. Tocodynamometer. 4,640,295, Cl. 128-748.000.

Isakson, Gary A.; and Larson, Curtis L., to Minnesota Mining and Manufacturing Company. Self-venting vapor-tight microwave oven package. 4,640,838, Cl. 426-107.000.

Ishikawa, Mamoru: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,641,147, Cl. 346-76.0PH.

Ishikawa, Masahiro: *See*—
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.

Ishikawa, Wataru: *See*—
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.

Ishikura, Tadashi: *See*—
Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, 4,640,971, Cl. 528-129.000.

Ishizaka, Takao: *See*—
Mine, Susumu; and Ishizaka, Takao, 4,640,005, Cl. 29-599.000.

Isoyama, Toyoshiro: *See*—
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.

Italtractor Meccanica ITM S.p.A.: *See*—
Crotti, Aldo, 4,640,559, Cl. 305-11.000.

Ito, Kiyoo: *See*—
Kimura, Katsutaka; Hori, Ryoichi; Ito, Kiyoo; and Sunami, Hideo, 4,641,279, Cl. 365-149.000.

Ito, Toshihiko: *See*—
Yamamoto, Shinichi; Ito, Toshihiko; and Asano, Mitsuru, 4,640,454, Cl. 228-161.000.

Ito, Tsuneo: *See*—
Yokoi, Shinichi; and Ito, Tsuneo, 4,640,809, Cl. 264-61.000.

Ito, Yasuyuki; and Sugawara, Toru, to Kabushiki Kaisha Toshiba. Ion source apparatus. 4,641,031, Cl. 250-423.00R.

Itoh, Masataka: *See*—
Okibayashi, Katsushi; Itoh, Masataka; and Katoh, Shohichi, 4,641,359, Cl. 382-68.000.

Itoh, Yoshio; Ohtsuka, Hiroshi; Nishimuro, Tadashi; and Moriyama, Norio, to Oki Electric Industry Co., Ltd. Alignment mark on a semiconductor and a method of forming the same. 4,640,888, Cl. 430-323.000.

ITT Corporation: *See*—
Kneib, Kristine N., 4,641,238, Cl. 364-200.000.
Stottlemyer, William O., 4,641,339, Cl. 379-391.000.
Wurst, Walter K., 4,641,300, Cl. 370-16.000.

Iwafune, Kasuke, to Victor Company of Japan, Ltd. Video signal recording and reproducing apparatus including a noise reduction circuit. 4,641,206, Cl. 360-33.100.

Iwai, Nobuo, to Alps Electric Co., Ltd. Optical head position control device. 4,641,020, Cl. 250-201.000.

Iwama, Norio: *See*—
Asano, Katsuhiro; Inaguma, Yukio; and Iwama, Norio, 4,641,075, Cl. 318-811.000.

Iwasaki, You: *See*—
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.

Iwashita, Yukihiro: *See*—
Hoshikawa, Jun; and Iwashita, Yukihiro, 4,640,583, Cl. 350-343.000.

Iwata Electric Works Co., Ltd.: *See*—
Nakamoto, Takayuki, 4,640,274, Cl. 128-321.000.

Iwatani, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Buried PN junction isolation regions for high power semiconductor devices. 4,641,172, Cl. 357-48.000.

J-Jet Konstruktion HB: *See*—
Olsson, John; Olsson, Bertil; and Olsson, Gunnar, 4,640,234, Cl. 123-557.000.

J. M. Voith GmbH: *See*—
Schiel, Christian; and Bauder, Albrecht, 4,639,990, Cl. 29-116.00R.

J. T. Baker Chemical Company: *See*—
Ramsden, Hugh E.; and Patterson, Joseph M., 4,640,909, Cl. 502-407.000.

Jacobine, Anthony F.; and Glaser, David M., to Loctite Corporation. Polyol terminated silicones and derivatives thereof. 4,640,940, Cl. 522-99.000.

Jacobsen, Marvin A., to Con-Vey/Keystone, Inc. Continuous feeding apparatus. 4,640,655, Cl. 414-119.000.

Jacobsson, Curt, to Asea Aktiebolag. Root mean square measuring device for negative sequence current. 4,641,088, Cl. 324-86.000.

Jaeger: *See*—
Hennequin, Yves, 4,641,122, Cl. 338-33.000.

James River Corporation: *See*—
Seiferth, Oscar E., 4,641,005, Cl. 219-10.55E.

Janda, Ralf; and Eppinger, Bernhard, to Kulzer & Co. GmbH. Photopolymerizable phosphate-containing adhesion promoting dental composition. 4,640,936, Cl. 522-14.000.

Jannusch, Reiner: *See*—
Lehmann, Eike; and Jannusch, Reiner, 4,640,216, Cl. 114-340.000.

Janome Sewing Machine Co, Ltd.: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, 4,640,210, Cl. 112-456.000.

Jansch, Peter A. G., to Saab-Scania Aktiebolag. Device for measuring oil level in an internal combustion engine. 4,640,126, Cl. 73-290.00R.

Janssen, Jeffrey R., to Minnesota Mining and Manufacturing Company. Graphic design article. 4,640,727, Cl. 156-240.000.

Jansson, Kurt, to AB A.K. Eriksson. Band saw installation with vertically spaced guides. 4,640,171, Cl. 83-797.000.

Japan Solar Energy Co., Ltd.: *See*—
Koiwai, Sakae; Asaoka, Keizo; Shirasawa, Katsuhiko; Watanabe, Hiroyuki; and Honda, Junichi, 4,640,001, Cl. 29-572.000.

Japan Tobacco Inc.: *See*—
Kagawa, Kenichi, 4,641,265, Cl. 364-153.000.
Okumoto, Yutaka, 4,640,168, Cl. 83-677.000.
Ono, Takahiro; Akutsu, Takao; and Fujiwara, Hideyuki, 4,640,299, Cl. 131-303.000.

Japenga, Robert J.; and Scott, Paul F., to Emhart Industries, Inc. Programmable control system for glassware forming machines. 4,641,269, Cl. 364-473.000.

Jeal, Alan J.: *See*—
Kelly, Patrick S.; Oswald, Thomas; Jeal, Alan J.; Hill, Stephen E.; and Murphy, Robert, 4,641,372, Cl. 455-601.000.

Jeffreys, John H.: *See*—
Kasper, James J.; and Jeffreys, John H., 4,640,982, Cl. 174-75.00R.

Jellovitz, John C.: *See*—
McMahon, Raymond D.; Jellovitz, John C.; Vaile, James T.; Renn, Gregory J.; and Ondeck, Elmer J., 4,640,165, Cl. 83-346.000.
Jemison, Emanuel B.: *See*—
Blosser, Henry G.; Burleigh, Richard J.; Blosser, Gabe F.; and Jemison, Emanuel B., 4,641,104, Cl. 328-234.000.
Jensen, Deborah P.: *See*—
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,640,525, Cl. 280-642.000.
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., to Boeing Company, The. Folding wheelchair. 4,640,525, Cl. 280-642.000.
JEOL Ltd.: *See*—
Kamo, Osamu; Ohuchi, Muneki; and Matsushita, Kazuhiro, 4,641,096, Cl. 324-311.000.
Jerskin, James T. Apparatus for supporting a fishing rod holder. 4,640,038, Cl. 43-17.000.
Jervis B. Webb Company: *See*—
Dehne, Clarence A., 4,640,196, Cl. 104-94.000.
Jeumont-Schneider Corporation: *See*—
Bonal, Jean, 4,641,234, Cl. 363-124.000.
Jidosha Kiki Co. Ltd.: *See*—
Kobayashi, Michio, 4,640,097, Cl. 60-554.000.
Jim Blackburn Designs, Inc.: *See*—
Blackburn, James R., 4,640,449, Cl. 224-41.000.
Jing-Sheng, Tseng. Super-thin enuresis alarm. 4,640,276, Cl. 128-138.00A.
John A. Kitchen Ltd.: *See*—
Kitchen, John A., 4,640,674, Cl. 431-1.000.
John Wyeth & Brother Limited: *See*—
Boyle, John T. A.; and Todd, Richard S., 4,640,920, Cl. 514-248.000.
White, Alan C.; Shepherd, Robin G.; and Langham, Barry J., 4,640,924, Cl. 514-291.000.
Johnsen, Kenneth D.; and Fletcher, Alan J., to Rockwell International Corporation. Plug for hole sealing. 4,640,434, Cl. 220-287.000.
Johnson, Ken A. Portable beverage chiller. 4,640,101, Cl. 62-294.000.
Johnson, Marvin M.; and McDaniel, Max P., to Phillips Petroleum Company. Olefin polymerization with polyphosphate supported chromium catalysts. 4,640,964, Cl. 526-134.000.
Johnson, Roger E., to White Consolidated Industries, Inc. High temperature, zero leakage packing assembly. 4,640,305, Cl. 137-312.000.
Johnson, William L.: *See*—
Atzmon, Michael; Johnson, William L.; and Verhoeven, John D., 4,640,816, Cl. 419-24.000.
Johnston, Clifford V.: *See*—
Boyles, William C.; Hagge, Douglas R.; and Johnston, Clifford V., 4,640,528, Cl. 280-789.000.
Jones, Carol A.: *See*—
Grierson, Jeffrey G.; Jones, Carol A.; and Spears, William D., 4,640,818, Cl. 422-15.000.
Jones, Lloyd G., to Mobil Oil Corporation. Multistep method for viscous hydrocarbon recovery. 4,640,357, Cl. 166-273.000.
Jones, Theodore L., to RCA Corporation. Method of forming fiber optic cable termination. 4,640,725, Cl. 156-85.000.
Jones and Vining, Incorporated: *See*—
Goguen, Peter J., 4,640,797, Cl. 252-301.360.
Jones, Warren C.: *See*—
Dery, Ronald A.; and Jones, Warren C., 4,640,981, Cl. 174-88.00R.
Jorgensen, Robert W.; Lewis, Thomas E.; and Kesler, Gregory J., to Harvey Hubbell Incorporated. Eccentric knockouts for metal boxes. 4,640,433, Cl. 220-266.000.
Joyce, Thomas F.; and Kelly, Richard P., to Honeywell Information Systems Inc. Control store memory read error resiliency method and apparatus. 4,641,305, Cl. 371-12.000.
Joyner, Auvin H. Funnel stock/sauce separator. 4,640,185, Cl. 99-495.000.
Jumberca, S.A.: *See*—
Dalmau Guell, Jose M., 4,640,104, Cl. 66-222.000.
Junet, Roland: *See*—
Casier, Yves; Cassagne, Philippe; Gicquel, Sylvain; and Junet, Roland, 4,640,458, Cl. 237-17.000.
Jungwirth, Dieter; and Mannhart, Also, to Dycherhoff & Widmann Ag. Anchoring and coupling device for tendons in prestressed concrete. 4,640,068, Cl. 52-223.00L.
Junkosha Company, Ltd.: *See*—
Imaizumi, Haruo; and Kobayashi, Satoru, 4,640,123, Cl. 73-61.10R.
Suzuki, Hirosuke, 4,640,866, Cl. 428-422.000.
Jurgens, Rainer, to Norton Christensen, Inc. Process and device for transmitting information over a distance. 4,641,289, Cl. 367-85.000.
Justus, Scott B.: *See*—
Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,815, Cl. 419-8.000.
Haswell, Walter T., Jr.; Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,814, Cl. 419-8.000.
Kabushiki Kaisha Furukawa Seisakusho: *See*—
Kawaguchi, Masashi; and Yasumune, Masaru, 4,640,081, Cl. 53-510.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Matsuda, Yukinobu; and Inui, Takayasu, 4,640,245, Cl. 123-339.000.
Kabushiki Kaisha Meidensha: *See*—
Kashiwagi, Yoshiyuki; Noda, Yasushi; and Kitakizaki, Kaoru, 4,640,999, Cl. 200-144.00B.
Kabushiki Kaisha Morita Seisakusho: *See*—
Makino, Takao; and Osada, Shinichi, 4,641,331, Cl. 378-108.000.
Kabushiki Kaisha Seiko Epson: *See*—
Hoshikawa, Jun; and Iwashita, Yukihiro, 4,640,583, Cl. 350-343.000.
Oguchi, Kikuo; and Uchikawa, Yoshiro, 4,640,582, Cl. 350-333.000.
Kabushiki Kaisha Toshiba: *See*—
Ando, Hideo; and Doi, Akihiko, 4,641,023, Cl. 250-216.000.
Horiguchi, Fumio, 4,641,280, Cl. 365-183.000.
Ito, Yasuyuki; and Sugawara, Toru, 4,641,031, Cl. 250-423.00R.
Kobayashi, Noboru, 4,641,052, Cl. 310-317.000.
Miyazawa, Yoshiaki, 4,641,042, Cl. 307-66.000.
Moore, John F., 4,641,119, Cl. 335-297.000.
Nagasaka, Hiroko; and Motegi, Nawoto, 4,640,737, Cl. 156-643.000.
Oyama, Masumi, 4,641,374, Cl. 455-603.000.
Saito, Tomotaka, 4,641,278, Cl. 365-78.000.
Sato, Masaki, 4,640,000, Cl. 29-571.000.
Shigemasa, Takashi; and Ichikawa, Yoshinori, 4,641,235, Cl. 364-149.000.
Shiraishi, Hajime, 4,641,044, Cl. 307-269.000.
Takesako, Sumiyoshi, 4,641,239, Cl. 364-408.000.
Yoshimaru, Tomohisa, 4,641,294, Cl. 369-32.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Asano, Katsuhiro; Inaguma, Yukio; and Iwama, Norio, 4,641,075, Cl. 318-811.000.
Kaga, Eiichi: *See*—
Yamazaki, Mutsuki; and Kaga, Eiichi, 4,641,168, Cl. 357-30.000.
Kagawa, Kenichi, to Japan Tobacco Inc. System for controlling the proportion of leaf vein in tobacco raw material treating process. 4,641,265, Cl. 364-153.000.
Kagiya, Kei: *See*—
Saito, Teruo; Asai, Kuniaki; Suzuki, Yasuro; and Kagiya, Kei, 4,640,961, Cl. 525-444.000.
Kagota, Nobuhiro; and Senoh, Hideaki, to Mitsubishi Paper Mills, Ltd. Alcohol-based flexographic ink for use in backcarbon papers. 4,640,714, Cl. 106-21.000.
Kahn, Leonard R. Automatic multi-system AM stereo receiver using existing single-system AM stereo decoder IC. 4,641,341, Cl. 381-15.000.
Kailath, Thomas: *See*—
Shan, Tiejun J.; and Kailath, Thomas, 4,641,259, Cl. 364-724.000.
Kajimura, Haruhiko; Nagano, Hiroo; and Miura, Minoru, to Sumitomo Metal Industries, Ltd. Dual-phase stainless steel with improved resistance to corrosion by nitric acid. 4,640,817, Cl. 420-50.000.
Kajitani, Kazuo: *See*—
Iba, Yoichi; Kimura, Tadashi; and Kajitani, Kazuo, 4,640,586, Cl. 350-414.000.
Kalbfeld, Jack W., to Union Connector Co., Inc. Support and strain relief combination. 4,640,984, Cl. 174-135.000.
Kalfs, Johannes J. W.: *See*—
Martens, Theodorus G. J. A.; Steenhof, Frits A.; and Kalfs, Johannes J. W., 4,641,310, Cl. 371-38.000.
Kalokitis, David, to RCA Corporation. Printed circuit radial power combiner with mode suppressing resistors fired at high temperature. 4,641,107, Cl. 330-286.000.
Kamai, Kenichiro, to Nippondenso Co., Ltd. Electronic fuel injection control with variable injection timing. 4,640,253, Cl. 123-475.000.
Kamaike, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. System for controlling a motor. 4,640,389, Cl. 187-119.000.
Kambic, Raymond V., to R. R. Brink Locking Systems, Inc. Security door knob and escutcheon. 4,640,112, Cl. 70-452.000.
Kamel, Mohamed S.: *See*—
Mazumder, Ali T.; and Kamel, Mohamed S., 4,641,018, Cl. 235-462.000.
Kamijo, Takao: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 4,640,329, Cl. 152-209.00R.
Kamiyama, Yoshiyasu: *See*—
Nishida, Yuji; Kamiyama, Yoshiyasu; and Okuno, Koichi, 4,640,773, Cl. 210-321.100.
Kamo, Osamu; Ohuchi, Muneki; and Matsushita, Kazuhiro, to JEOL Ltd. Nuclear magnetic resonance spectrometry. 4,641,096, Cl. 324-311.000.
Kanagawa Mfg., Co., Ltd.: *See*—
Goto, Hajime; Amemiya, Ikuzo; Nakayama, Masanobu; and Hatano, Yoshinobu, 4,639,988, Cl. 29-25.350.
Kanda, Nobuo: *See*—
Kondo, Mitsuru; Okimoto, Tomoyuki; and Kanda, Nobuo, 4,641,160, Cl. 346-220.000.
Kane, Gordon R.: *See*—
Albaugh, Neil P.; and Kane, Gordon R., 4,641,105, Cl. 330-9.000.
Kaneko, Masahiko: *See*—
Nakai, Toshihiko; and Kaneko, Masahiko, 4,640,635, Cl. 400-664.000.
Kano, Atsushi: *See*—
Kozuka, Nobuhiko; Koyama, Shigeo; and Kano, Atsushi, 4,640,604, Cl. 355-3.00R.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Kondo, Mitsuru; Okimoto, Tomoyuki; and Kanda, Nobuo, 4,641,160, Cl. 346-220.000.
Kaplan, Gary M.; Karau, Robert T.; Winney, Norman E., Jr.; and Brader, David G., to Communications Transfer Corp. Universal package for prerecorded computer disk and associated instructional material. 4,640,413, Cl. 206-232.000.

Kaplan, Robert L.: *See*—
McGowan, George A.; and Kaplan, Robert L., 4,641,288, Cl. 367-20.000.

Kapoor, Anoop, to Westinghouse Electric Corp. Nuclear fuel rod loading fixture for use in a remote repair system. 4,639,993, Cl. 29-400.00N.

Kapoor, Ashok K.: *See*—
Thomas, Michael E.; Vora, Madhukar B.; and Kapoor, Ashok K., 4,640,004, Cl. 29-590.000.

Kappus, Gunter: *See*—
Habfast, Karl-Eugen; Kappus, Gunter; Rache, Horst; and Windel, Bernd, 4,641,029, Cl. 250-288.000.

Kapuscinski, Maria M.; Liu, Christopher S.; Hart, William P.; and Grina, Larry D., to Texaco Inc. Hydrocarbon compositions containing polyolefin graft polymers. 4,640,788, Cl. 252-51.50R.

Karau, Robert T.: *See*—
Kaplan, Gary M.; Karau, Robert T.; Winney, Norman E., Jr.; and Brader, David G., 4,640,413, Cl. 206-232.000.

Karsh, Herbert; and Calaway, Ward M., to Eastman Kodak Company. Signal correction apparatus. 4,641,324, Cl. 375-76.000.

Kasai, Junichi; and Imai, Hiroshi, to Nissan Motor Company, Limited. Audio equipment. 4,641,344, Cl. 381-57.000.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Releasable buckle. 4,639,982, Cl. 24-616.000.

Kashiwagi, Yoshiyuki; Noda, Yasushi; and Kitakizaki, Kaoru, to Kabushiki Kaisha Meidensha. Contact material of vacuum interrupter and manufacturing process therefor. 4,640,999, Cl. 200-144.00B.

Kasper, James J.; and Jeffreys, John H., to Watteredge-Uniflex, Inc. Cable termination and method. 4,640,982, Cl. 174-75.00R.

Kastel, Walter; and Geiger, Wolfgang, to Endress u. Hauser GmbH u. Co. Sensor. 4,640,135, Cl. 73-716.000.

Kataishi, Ryuichiro: *See*—
Seki, Hiroshi; and Kataishi, Ryuichiro, 4,640,628, Cl. 374-141.000.

Kataoka, Keiji; and Saito, Susumu, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Lens-on-disc type optical scanning apparatus. 4,640,573, Cl. 350-6.100.

Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., to Robertshaw Controls Company. Burner control device, system and method of making the same. 4,640,676, Cl. 431-54.000.

Kato, Hidetoshi; Maehara, Fuyuky; and Mayumi, Nobuo, to Nippondenso Co., Ltd. Battery voltage regulating system. 4,641,079, Cl. 320-64.000.

Kato, Hidetoshi: *See*—
Musha, Kazuhiko; Tago, Kohichi; and Kato, Hidetoshi, 4,641,196, Cl. 358-246.000.

Kato, Hiroyuki; and Yamana, Toshifumi, to Rinnai Kabushiki Kaisha. Ceramic burner plate for gas combustion. 4,640,261, Cl. 126-39.00J.

Kato, Shigeru; Osada, Naomi; Ichitoh, Toshikatsu; Murata, Masae; and Mochizuki, Masfumi, to Victor Company of Japan, Limited. Thermal transfer recording apparatus. 4,641,151, Cl. 346-76.0PH.

Kato, Takeo: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 4,640,329, Cl. 152-209.00R.

Kato, Tetsuro: *See*—
Nakamura, Yoshiyuki; Kato, Tetsuro; and Ebihara, Norio, 4,641,202, Cl. 358-313.000.

Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, to Olympus Optical Co., Ltd. Exposure control device for electronic photographing apparatus. 4,641,215, Cl. 360-35.100.

Katoh, Shohichi: *See*—
Okibayashi, Katsushi; Itoh, Masataka; and Katoh, Shohichi, 4,641,359, Cl. 382-68.000.

Katz, Marcella M. Flexible non-distortable handcraft sheet material and method of applying printed designs thereto. 4,640,529, Cl. 281-5.000.

Katz, Stanley A.: *See*—
Decker, Joseph A., Jr.; Fiore, Joseph F., Jr.; and Katz, Stanley A., 4,640,392, Cl. 190-108.000.

Kavanaugh, Mark A.: *See*—
Hoffman, Robert K.; Kavanaugh, Mark A.; and Franson, David C., 4,640,309, Cl. 137-596.180.

Kawada, Shinichi: *See*—
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.

Kawade, Hideji; Takahashi, Hideaki; Sato, Yoshiyuki; and Urayama, Yuji, to Tamura Electric Works Ltd.; and Victor Company of Japan Limited. Telephone answering apparatus having two integrators of different time constants. 4,640,990, Cl. 379-77.000.

Kawaguchi, Masashi; and Yasumune, Masaru, to Kabushiki Kaisha Furukawa Seisakusho. Automatic packaging apparatus. 4,640,081, Cl. 53-510.000.

Kawai, Katsuhiro: *See*—
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki, 4,641,065, Cl. 318-135.000.

Kawakami, Eigo: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.

Kawamura, Yoshihisa; and Fukuzumi, Shuzo, to Nissan Motor Company, Limited. System for controlling an ignition timing in an internal combustion engine and method therefor. 4,640.249, Cl. 123-425.000.

Kawanabe, Tsuyoshi, to Canon Kabushiki Kaisha. Electronic computer with aural output. 4,641,258, Cl. 364-710.000.

Kawanishi, Tsuneaki; Mori, Yasuki; Noguchi, Koji; and Iimura, Tsutomu, to Hitachi Metals Co., Ltd.; and Hitachi, Ltd. Electrophotographic process with magnetic brush development using semiconductive ferrite carriers. 4,640,880, Cl. 430-106.600.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nakano, Hideaki; and Ozu, Tadahiro, 4,640,236, Cl. 123-41.790.

Kawasaki Steel Corporation: *See*—
Irie, Toshio; Kyono, Kazuaki; Kimura, Hajime; and Kurokawa, Shigeo, 4,640,872, Cl. 428-659.000.

Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material. 4,640,892, Cl. 430-617.000.

Kawata, Ken: *See*—
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,640,891, Cl. 430-551.000.

Keller, Jakob: *See*—
Duerig, Thomas; Escudier, Marcel; and Keller, Jakob, 4,640,806, Cl. 264-9.000.

Kelley, David C.: *See*—
Lancaster, Gerald M.; Kelley, David C.; Cramm, Russell H.; and Neywick, Charles V., 4,640,865, Cl. 428-421.000.

Kelly, David L.: *See*—
Grist, Warren W.; and Kelly, David L., 4,640,491, Cl. 249-219.00W.

Kelly, Patrick S.; Oswald, Thomas; Jeal, Alan J.; Hill, Stephen E.; and Murphy, Robert, to STC PLC. Power feeding submarine telecommunications systems. 4,641,372, Cl. 455-601.000.

Kelly, Richard P.: *See*—
Joyce, Thomas F.; and Kelly, Richard P., 4,641,305, Cl. 371-12.000.

Kelm, Roger W., to Duracell Inc. Metal/air cell. 4,640,874, Cl. 429-27.000.

Kemper, Kyran B.; and Vetter, Robert W., Jr., to AT&T Company; and AT&T Bell Laboratories. Mechanized loop testing using a local metallic access port. 4,641,299, Cl. 370-15.000.

Kendall Company, The: *See*—
Lewis, Terry D., 4,640,128, Cl. 73-866.500.

Kennecott Corporation: *See*—
Cerdan-Diaz, Juan M.; Sanders, Michael J.; and Wellar, Mark E., 4,640,848, Cl. 427-426.000.

Kensinger, Roger C. Convertible bedding assembly and mattress. 4,639,952, Cl. 5-13.000.

Keprda, Jaroslav, to Siemens Aktiengesellschaft. Key module for keyboards having a dome-shaped key member of resilient material. 4,641,004, Cl. 200-340.000.

Kern, Donald W. Ozone injection method and apparatus. 4,640,783, Cl. 210-760.000.

Kerschbaum, Ewald: *See*—
Hartmann, Hans; and Kerschbaum, Ewald, 4,640,382, Cl. 181-175.000.

Keryhuel, Alain; and Meigne, Christian, to Burroughs Corporation. Semiconductor package with contact springs. 4,641,176, Cl. 357-74.000.

Kesler, Gregory J.: *See*—
Jorgensen, Robert W.; Lewis, Thomas E.; and Kesler, Gregory J., 4,640,433, Cl. 220-266.000.

Khang, Soon-Jai: *See*—
Lee, Kew-Ho; and Khang, Soon-Jai, 4,640,901, Cl. 501-81.000.

Khoshnevisan, Mohsen: *See*—
Tracy, John M.; Yeh, Pochi A.; and Khoshnevisan, Mohsen, 4,640,618, Cl. 356-345.000.

Khoury, Issam A.; Heistand, Robert H., II; and Kohatsu, Iwao, to Dow Chemical Company, The. Thin tape for dielectric materials. 4,641,221, Cl. 361-321.000.

Kibe, Satoshi: *See*—
Mori, Makihiko; Kibe, Satoshi; and Maeda, Toyohiro, 4,640,761, Cl. 208-44.000.

Kiel, Bernd: *See*—
Fauck, Gerhard; Kiel, Bernd; and Ulrich, Helmut, 4,640,556, Cl. 303-22.00R.

Kiesel, George W.: *See*—
Morris, Robert A.; Rajotte, Paul T.; Russell, Ronald R.; and Kiesel, George W., 4,641,217, Cl. 361-45.000.

Kikuchi, Hiroshi: *See*—
Niinomi, Tatsuya; and Kikuchi, Hiroshi, 4,640,663, Cl. 414-730.000.

Kikuchi, Toshiyuki: *See*—
Higashi, Haruki; Yashiki, Seiji; Waki, Kouichirou; and Kikuchi, Toshiyuki, 4,640,394, Cl. 192-3.290.

Kilbane, George J.; and Subrahmanian, K. P., to Minnesota Mining and Manufacturing Company. Foam-sealed electrical devices and method and composition therefor. 4,640,978, Cl. 174-23.00R.

Kim, Bumman; and Tserng, Hua Q., to Texas Instruments Incorporated. Heterojunction device. 4,641,161, Cl. 357-22.000.

Kim, Choung U.; and Misco, Peter F., Jr., to Bristol-Myers Company. Carbapenem antibiotics. 4,640,799, Cl. 540-350.000.

Kimball, David J.: *See*—
Sylvester, Judith M.; and Kimball, David J., 4,640,790, Cl. 252-62.540.

Kimberly-Clark Corporation: *See*—
Ales, Thomas M.; Strohbeen, David T.; Damico, Joyce A.; Van Gompel, Paul T.; and Abel, Kent W., 4,639,949, Cl. 2-400.000.
Sallee, Lorry F.; and Popp, Robert L., 4,640,726, Cl. 156-85.000.

Kimoto, Kiyoshi: *See*—
Mizunoe, Katsumi; Yanai, Junichi; and Kimoto, Kiyoshi, 4,641,296, Cl. 369-46.000.

Kimura, Hajime: *See—*
Irie, Toshio; Kyono, Kazuaki; Kimura, Hajime; and Kurokawa, Shigeo, 4,640,872, Cl. 428-659.000.
Kimura, Katsuji: *See—*
Yokoyama, Yukio; Kimura, Katsuji; and Goto, Naohisa, 4,641,366, Cl. 455-89.000.
Kimura, Katsutaka; Hori, Ryoichi; Ito, Kiyoo; and Sunami, Hideo, to Hitachi, Ltd. Semiconductor memory device having a dummy cell and a memory cell which is twice the size of the dummy cell. 4,641,279, Cl. 365-149.000.
Kimura, Shigeaki: *See—*
Oe, Tsutomu; Kimura, Shigeaki; Yuzaki, Yoshinori; and Ozaki, Tadao, 4,640,453, Cl. 228-17.700.
Kimura, Tadashi: *See—*
Iba, Yoichi; Kimura, Tadashi; and Kajitani, Kazuo, 4,640,586, Cl. 350-414.000.
Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Radiation image recording and reproducing system. 4,641,242, Cl. 364-414.000.
Kind, Stuart S.; Sanger, David G.; Twibell, John D.; and Hargraves, John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Identifying means. 4,640,035, Cl. 40-625.000.
Kinki Denki Co., Ltd.: *See—*
Tomita, Masao, 4,640,794, Cl. 252-194.000.
Kinoshita, Takao, to Canon Kabushiki Kaisha. Image pick-up apparatus. 4,641,183, Cl. 358-44.000.
Kinoshita, Taketoshi: *See—*
Shimizu, Kimihiro; Nakahara, Tsuguji; Kinoshita, Taketoshi; Takatsuka, Jun; and Igarashi, Michiko, 4,640,835, Cl. 424-94.000.
Kioritz Corporation: *See—*
Baba, Toru, 4,640,084, Cl. 56-12.700.
Kirkhill Rubber Company: *See—*
Mock, Donald E., 4,640,314, Cl. 138-162.000.
Kirsch, Bernhard. Ski boot with release mechanism. 4,640,026, Cl. 36-117.000.
Kishida, Takao; and Fukaya, Takeo, to Toa Harbor Works, Co., Ltd. Method of and apparatus for measuring pile skin friction. 4,640,118, Cl. 73-9.000.
Kishimoto, Masaru: *See—*
Imanishi, Kiyokazu; Naka, Hiroyuki; Sakurai, Yasuo; Ichiyanagi, Takashi; and Kishimoto, Masaru, 4,641,214, Cl. 360-130.240.
Kitagawa Industries Co., Ltd.: *See—*
Matsui, Kazuhiro, 4,640,639, Cl. 403-24.000.
Kitagishi, Tomoji: *See—*
Suzaki, Masafumi; Mikami, Katsumasa; Nagano, Yousuke; and Kitagishi, Tomoji, 4,641,149, Cl. 346-76.0PH.
Kitajima, Eiji: *See—*
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, 4,640,822, Cl. 422-111.000.
Kitakizaki, Kaoru: *See—*
Kashiwagi, Yoshiyuki; Noda, Yasushi; and Kitakizaki, Kaoru, 4,640,999, Cl. 200-144.00B.
Kitano, Kisei: *See—*
Ogawa, Tetsuya; Kitano, Kisei; Goto, Yasuyuki; Fukui, Masahiro; and Sugimori, Shigeru, 4,640,795, Cl. 252-299.500.
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.
Kitchen, John A., to John A. Kitchen Ltd. Pulse combustion apparatus. 4,640,674, Cl. 431-1.000.
Kittle, Carl E.; LaFave, Arthur J.; and Olson, David L., to Deere & Company. Draft sensor including strain sensor coupled to load strap. 4,640,368, Cl. 172-430.000.
Klapper, Kenneth K.: *See—*
Widener, Wade H.; and Klapper, Kenneth K., 4,640,407, Cl. 198-389.000.
Klaren, Dick G., to Esmil B.V. Apparatus for carrying out physical and/or chemical processes, more specifically a heat exchanger of the continuous type. 4,640,339, Cl. 165-1.000.
Klauke, Erich: *See—*
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, 4,640,923, Cl. 514-272.000.
Kleiner, Frank: *See—*
Zecher, Wilfried; Reinking, Klaus; and Kleiner, Frank, 4,640,970, Cl. 528-73.000.
Klemm, Robert E., to Construction Forms, Inc. Adjustable pipe extender for high pressure lines carrying abrasive materials. 4,640,533, Cl. 285-62.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Steinbiss, Eberhard; Herchenbach, Horst; and Wolter, Albrecht, 4,640,681, Cl. 432-14.000.
Wolter, Albrecht; Hartmann, Rolf; Herchenbach, Horst; and Grisar, Alexander, 4,640,203, Cl. 110-346.000.
Knapek, Erwin: *See—*
Schmid, Ralf; Otto, Johann; Bernklau, Daniela; and Knapek, Erwin, 4,640,626, Cl. 374-57.000.
Kneib, Kristine N., to ITT Corporation. Multiprocessor system employing dynamically programmable processing elements controlled by a master processor. 4,641,238, Cl. 364-200.000.
Knodel, Gunter; and Helms, Georg, to GETRAG Getriebe- und Zahnradfabrik GmbH. Gearbox-transmission with synchronized reverse-gear. 4,640,141, Cl. 74-357.000.
Knorr-Bremse AG: *See—*
Saumweber, Eckart; and Schmitt, Otto, 4,640,390, Cl. 188-73.370.
Knothe, Herbert; and Roschmann, Klaus, to Teldec Schallplatten GmbH. Process for producing a cutting base. 4,640,745, Cl. 204-5.000.
Koa Oil Company, Limited: *See—*
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, 4,640,822, Cl. 422-111.000.
Kobayashi, Atsuo: *See—*
Nishino, Kenichi; Kobayashi, Atsuo; Higashi, Sachio; Yamamoto, Shinichiro; and Yasuda, Kiyoshi, 4,640,950, Cl. 524-265.000.
Kobayashi, Kenichi, to Fujitsu Limited. Inspection method and apparatus for a mask pattern used in semiconductor device fabrication. 4,641,353, Cl. 382-8.000.
Kobayashi, Masao: *See—*
Wudl, Fred; Kobayashi, Masao; and Heeger, Alan, 4,640,748, Cl. 204-59.00R.
Kobayashi, Michio, to Jidosha Kiki Co. Ltd. Brake booster. 4,640,097, Cl. 60-554.000.
Kobayashi, Noboru, to Kabushiki Kaisha Toshiba. Input circuit for a stacked type piézo-electric element device. 4,641,052, Cl. 310-317.000.
Kobayashi, Satoru: *See—*
Imaizumi, Haruo; and Kobayashi, Satoru, 4,640,123, Cl. 73-61.10R.
Kobayashi, Takehiro: *See—*
Murakami, Hideo; and Kobayashi, Takehiro, 4,640,471, Cl. 242-84.530.
Kobayashi, Teruo; and Uchida, Sadao, to Toyoda Gosei Co., Ltd. Steering wheel with integrally-skinned foamed thermoplastic resin-covered handwheel core having flow mark-obscuring abrasion-resistant coating. 4,640,150, Cl. 74-552.000.
Kobayashi, Toshifumi: *See—*
Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, 4,641,281, Cl. 365-189.000.
Kobayashi, Yoshiaki: *See—*
Fujihisa, Hiroaki; Fujii, Hiroshi; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,641,001, Cl. 200-153.00G.
Kodama, Katsuhiko; and Yamazoe, Hisamitsu, to Nippondenso Co., Ltd. Engine control with exhaust gas recirculation. 4,640,257, Cl. 123-571.000.
Koehler, Gernot: *See—*
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, 4,640,749, Cl. 204-59.00R.
Koen, Myron J.: *See—*
Halbert, Joel M.; and Koen, Myron J., 4,641,246, Cl. 364-487.000.
Koenig, Linda S. Restraining garment with detachable bib. 4,639,946, Cl. 2-49.00R.
Koerner, Rudi. Apparatus for casting materials for false teeth. 4,640,334, Cl. 164-287.000.
Koga, Kazuyoshi: *See—*
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.
Kohatsu, Iwao: *See—*
Khoury, Issam A.; Heistand, Robert H., II; and Kohatsu, Iwao, 4,641,221, Cl. 361-321.000.
Kohayakawa, Masami, to Toko, Inc. Delay line device and method of making same. 4,641,112, Cl. 333-140.000.
Kohno, Teruo, to Victor Company of Japan, Limited. Camera holder. 4,640,481, Cl. 248-126.000.
Koike, Akihiko: *See—*
Koike, Yuzuru; Koike, Akihiko; and Ueno, Masayuki, 4,640,244, Cl. 123-339.000.
Koike, Yuzuru; Koike, Akihiko; and Ueno, Masayuki, to Honda Giken Kogyo Kabushiki Kaisha. Idling speed feedback control method for internal combustion engines. 4,640,244, Cl. 123-339.000.
Koiwai, Sakae; Asaoka, Keizo; Shirasawa, Katsuhiko; Watanabe, Hiroyuki; and Honda, Junichi, to Japan Solar Energy Co., Ltd. Solar cell manufacturing method. 4,640,001, Cl. 29-572.000.
Kojima, Hiroshi: *See—*
Shibata, Junichi; and Kojima, Hiroshi, 4,641,116, Cl. 333-204.000.
Kokubu, Yoshinori; and Moriyasu, Makoto, to Asahi Glass Company, Ltd. Low expansion glass. 4,640,900, Cl. 501-67.000.
Kolb, Dieter; and Pieper, Norbert, to Fichtel & Sachs AG. Friction clutch with tangential leaf springs. 4,640,398, Cl. 192-70.180.
Kollektivgesellschaft Eberhard, Steiner & Dr. Stocker: *See—*
Steiner, Paul; and Stocker, Bruno, 4,640,451, Cl. 227-76.000.
Koltookian, Sarkis A., to Deere & Company. Vehicle clutch lube control system. 4,640,401, Cl. 192-85.00R.
Komaki, Shigeki, to Sharp Kabushiki Kaisha. Electronic apparatus with a flat panel keyboard unit. 4,640,994, Cl. 200-5.00A.
Komatsu, Moriyuki: *See—*
Noda, Kazushi; Komatsu, Moriyuki; and Mitsunaga, Hiroshi, 4,640,340, Cl. 165-41.000.
Komatsu, Satsuki, to Olympus Optical Co., Ltd. Ion concentration measuring apparatus. 4,641,084, Cl. 324-71.500.
Komorita, Kazuo; Miyoshi, Masanobu; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide multilayer color photographic material. 4,640,889, Cl. 430-505.000.
Komossa, Werner; Hausler, Nikolaus; and Elsner, Uwe, to Hauni-Werke Korber & Co. KG. Apparatus for grinding the knives in tobacco cutting machines. 4,640,059, Cl. 51-5.00D.
Kompis, Ivan; and Weiss, Ekkehard, to Hoffmann-La Roche Inc. Substituted 2-phenyl-1,3-dioxolanes. 4,640,918, Cl. 514-222.000.
Komuro, Toshio, to Sony Corporation. Cassette tape player combined with a radio receiver which has multiple push buttons such that the

stop push button can be used to turn off either the cassette tape player or the radio receiver. 4,641,293, Cl. 369-6.000.

Kondo, Hiroatsu: *See*—
Ozawa, Toshiaki; Yamada, Yasuaki; and Kondo, Hiroatsu, 4,640,634, Cl. 400-144.200.

Kondo, Mitsuru; Okimoto, Tomoyuki; and Kanda, Nobuo, to Kanzaki Paper Manufacturing Co., Ltd. Recording system utilizing phthalide derivatives as colorless chromogenic material. 4,641,160, Cl. 346-220.000.

Konig, Heinz: *See*—
Heinemann, Zoltan; and Konig, Heinz, 4,640,356, Cl. 166-272.000.

Konishi, Kazuo: *See*—
Mitsudera, Hiroyuki; Konishi, Kazuo; and Sato, Yasuo, 4,640,929, Cl. 514-436.000.

Konishi, Yozo; Akashi, Kichizo; Watase, Hideo; and Yoshioka, Tatsuo, to Hitachi, Ltd. Piling planning method and piling system of cargoes by palletizing robot. 4,641,271, Cl. 364-478.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Komorita, Kazuo; Miyoshi, Masanobu; and Onodera, Kaoru, 4,640,889, Cl. 430-505.000.
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,641,200, Cl. 358-296.000.

Kopola, Harri: *See*—
Myllyla , Risto; Kopola, Harri; Kostamovaara, Juha; and Ahola, Raimo, 4,640,514, Cl. 273-310.000.

Koppers, Manfred; Bohnes, Karlheinz; and Amling, Friedel, to Bochumer Eisenhutte Heintzmann GmbH & Co. Kg. Hydraulically operated unit for roof support. 4,640,650, Cl. 405-290.000.

Koroscil, Anthony, to American Cyanamid Company. Chemiluminescent light container. 4,640,193, Cl. 102-336.000.

Koseki, Ryoji, to Amada Engineering Service Co., Inc. Laser tube holder in a laser oscillator. 4,641,314, Cl. 372-65.000.

Koshigoe, Shinpei; and Fujiwara, Takeshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron gun. 4,641,058, Cl. 313-449.000.

Kossowsky, Ram: *See*—
Fromson, Robert E.; Kossowsky, Ram; and Nunamaker, Charles S., 4,640,169, Cl. 83-685.000.

Kostamovaara, Juha: *See*—
Myllyla , Risto; Kopola, Harri; Kostamovaara, Juha; and Ahola, Raimo, 4,640,514, Cl. 273-310.000.

Kowalczyk, Thaddeus. Security eyes for prevention of car accidents. 4,641,136, Cl. 340-903.000.

Kowalik, Ralph M.: *See*—
Peiffer, Dennis G.; Kowalik, Ralph M.; and Lundberg, Robert D., 4,640,945, Cl. 523-336.000.

Koyama, Shigeo: *See*—
Kozuka, Nobuhiko; Koyama, Shigeo; and Kano, Atsushi, 4,640,604, Cl. 355-3.00R.

Koyo Jidoki Kabushiki Kaisha: *See*—
Daido, Toshihiko; Matsubara, Hideo; and Hirakushi, Shuzo, 4,640,380, Cl. 180-141.000.

Koyo Seiko Kabushiki Kaisha: *See*—
Daido, Toshihiko; Matsubara, Hideo; and Hirakushi, Shuzo, 4,640,380, Cl. 180-141.000.

Kozponti Valto-es Hitelbank Rt.: *See*—
Rubik, Erno, 4,640,062, Cl. 52-109.000.

Kozuka, Nobuhiko; Koyama, Shigeo; and Kano, Atsushi, to Mita Industrial Co., Ltd. Electrostatic photographic copying machine provided with a movable sorter. 4,640,604, Cl. 355-3.00R.

Kraftwerk Union Aktiengesellschaft: *See*—
Kroning, Michael; Holzler, Georg; and Heumuller, Roland, 4,640,131, Cl. 73-600.000.
Leuker, Wilhelm; Stipsits, Gunter; and Thiel, Bernhard, 4,640,121, Cl. 73-40.50A.
Weber, Robert; and Forster, Josef, 4,640,346, Cl. 165-95.000.

Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., to Mobil Oil Corporation. Apparatus for injecting liquid hydrocarbon feed and steam into a catalytic cracking zone. 4,640,463, Cl. 239-424.000.

Kramer, Manfred: *See*—
Hafele, Walter; Kramer, Manfred; Schmieder, Dietmar; and Warga, Johann, 4,640,255, Cl. 123-495.000.

Krasnov, Igor: *See*—
Kucher, Alexander; Krasnov, Igor; and Bromberg, Yury, 4,640,384, Cl. 182-51.000.

Kratz, Walter. Reflector for linear light sources. 4,641,226, Cl. 362-218.000.

Kreider, David R.; McCullum, Albert; Rose, Philip M.; and Lin, Chi-Hung, to Standard Oil Company (Indiana). Method and apparatus for recycle of entrained solids in off-gas from a gas-phase polyolefin reactor. 4,640,963, Cl. 526-67.000.

Kremsmunster, Austria: *See*—
Weingartner, Rudolf, 4,640,437, Cl. 220-400.000.

Krilov, Alexandre, to Minister for Industry and Decentralization of the State of New South Wales, The. Ultra high pressure water log debarking. 4,640,327, Cl. 144-340.000.

Kroning, Michael; Holzler, Georg; and Heumuller, Roland, to Kraftwerk Union Aktiengesellschaft. Method and apparatus for the ultrasonic testing of bolts with a wall thickness discontinuity. 4,640,131, Cl. 73-600.000.

Krueger, William H.: *See*—
Binnersley, Edwin K.; and Krueger, William H., 4,640,861, Cl. 428-294.000.

Kruger, Klaus: *See*—
Romer, Manfred; Woletz, Peter; and Kruger, Klaus, 4,640,938, Cl. 522-79.000.

Krukas, David: *See*—
Lerner, Joseph S.; and Krukas, David, 4,640,731, Cl. 156-355.000.

Kubo, Junichi, to Nippon Oil Co., Ltd. Method for cracking heavy hydrocarbon oils. 4,640,765, Cl. 208-110.000.

Kubo, Tateo: *See*—
Takeda, Hiroshi; Oshima, Noritsugu; Kubo, Tateo; and Sakaguchi, Kenichi, 4,640,673, Cl. 425-297.000.

Kubota, Kenji: *See*—
Gion, Hidenori; Kubota, Kenji; Nakamura, Michihiro; and Yano, Makoto, 4,641,249, Cl. 364-496.000.

Kucher, Alexander; Krasnov, Igor; and Bromberg, Yury. Emergency evacuation system for high-rise buildings. 4,640,384, Cl. 182-51.000.

Kudo, Sinji, to Stanley Electric Co., Ltd. Pulse absorption circuit for power source circuit. 4,641,230, Cl. 363-56.000.

Kuhbauch, Gerd, to Robert Bosch GmbH. Windshield wiper device. 4,639,966, Cl. 15-250.230.

Kuhle, Engelbert: *See*—
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, 4,640,923, Cl. 514-272.000.

Kuhnel, Hans D.: *See*—
Breimeier, Kurt; Eickhoff, Heinrich; Erdmann, Hans-Walter; and Kuhnel, Hans D., 4,640,054, Cl. 49-504.000.

Kuipers, Ulrich: *See*—
Bonfig, Karl-Walter; Himmel, Jorg; and Kuipers, Ulrich, 4,641,120, Cl. 337-242.000.

Kuka Wehrtechnik GmbH: *See*—
Schiele, August; and Huber, Wolfgang, 4,640,181, Cl. 89-46.000.

Kuless, Madeline A., to Grumman Aerospace Corporation. Automated process for cold working holes. 4,640,114, Cl. 72-22.000.

Kullmann, Jorg: *See*—
Kullmann, Rolf; and Kullmann, Jorg, 4,640,172, Cl. 83-835.000.

Kullmann, Rolf; and Kullmann, Jorg, to Wilhelm H. Kullmann Wikus-Sagenfabrik. Saw blade. 4,640,172, Cl. 83-835.000.

Kulzer & Co. GmbH: *See*—
Janda, Ralf; and Eppinger, Bernhard, 4,640,936, Cl. 522-14.000.

Kumagai, Ken, to Concast AG. Roller apron for casting of support-pre-profiles or sectional shapes and blooms in a continuous casting installation. 4,640,338, Cl. 164-448.000.

Kumagai, Naotake: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.

Kumahira Safe Co., Inc.: *See*—
Hashizume, Masao, 4,640,111, Cl. 70-314.000.

Kumura, Yukimasa: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, 4,640,822, Cl. 422-111.000.

Kuo, Yue. Semiconductor spin coating method. 4,640,846, Cl. 427-82.000.

Kuraray Co., Ltd.: *See*—
Akazawa, Toshiyuki; Tanaka, Yoshinari; and Okaya, Takuji, 4,640,870, Cl. 428-483.000.
Gion, Hidenori; Kubota, Kenji; Nakamura, Michihiro; and Yano, Makoto, 4,641,249, Cl. 364-496.000.

Kurata, Masayuki: *See*—
Machara, Toshifumi; and Kurata, Masayuki, 4,640,391, Cl. 188-353.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio; and Igarashi, Yuriko, 4,640,847, Cl. 427-150.000.

Kurk, Robert L. Wood cutting apparatus. 4,640,161, Cl. 83-104.000.

Kurokawa, Shigeo: *See*—
Irie, Toshio; Kyono, Kazuaki; Kimura, Hajime; and Kurokawa, Shigeo, 4,640,872, Cl. 428-659.000.

Kuroki, Satoshi: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.

Kurotobi, Yohji: *See*—
Ohishi, Toshio; and Kurotobi, Yohji, 4,640,698, Cl. 55-502.000.

Kurotori, Tsuneo: *See*—
Ariyama, Kenzo; Kurotori, Tsuneo; and Mochizuki, Manabu, 4,640,605, Cl. 355-4.000.

Kurtz, Thomas D. Door hinge shim. 4,639,971, Cl. 16-247.000.

Kurzbock, Erich, to Teufelberger Gesellschaft m.b.H. Rope. 4,640,178, Cl. 87-6.000.

Kusch & Co. Stizmobelwerke KG: *See*—
Desanta, Simon, 4,640,548, Cl. 297-320.000.

Kuse, Kazuki, to Yoshida Kogyo K. K. Apparatus for combining fastener stringers. 4,640,008, Cl. 29-767.000.

Kushida, Hachiro, to Citizen Watch Co., Ltd. External member for a watch. 4,640,625, Cl. 368-280.000.

Kushino, Mitsuo: *See*—
Tsubakimoto, Tsuneo; Fujikawa, Iwao; and Kushino, Mitsuo, 4,640,584, Cl. 350-344.000.

Kushner, Gerald J.; and Toma, Daniel N., to General Electric Company. Automatic washer suspension system. 4,640,105, Cl. 68-23.300.

Kusuhara, Masaki, to Wacom Co., Ltd. Solar simulator. 4,641,227, Cl. 362-231.000.

Kuze, Takashi: *See*—
Sugai, Shinzo; Yamane, Shigemi; and Kuze, Takashi, 4,640,723, Cl. 148-411.000.

Kuzunuki, Soshiro: *See—*
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.

Kyle, John R.: *See—*
Bhat, Deepak G.; Shah, Dhirajlal C.; Kyle, John R.; and Woerner, Paul F., 4,640,693, Cl. 51-295.000.

Kyono, Kazuaki: *See—*
Irie, Toshio; Kyono, Kazuaki; Kimura, Hajime; and Kurokawa, Shigeo, 4,640,872, Cl. 428-659.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Mochida, Kemichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, 4,640,919, Cl. 514-241.000.

La Telemecanique Electrique: *See—*
Lalloz, Paul; and Vo, Hung A., 4,641,270, Cl. 364-476.000.

Lab Products, Inc.: *See—*
Sedlacek, Robert S.; and Campbell, Neil, 4,640,228, Cl. 119-15.000.

Labas, Nicholas: *See—*
Schraff, Raymond J.; Miller, Thomas M.; and Labas, Nicholas, 4,640,202, Cl. 110-336.000.

LaBate, Micheal D.; and Perri, Joseph, to Insul Company, Inc. Horizontally and vertically movable elevated apparatus for placing slag retaining means in tapping converters. 4,640,498, Cl. 266-272.000.

Laboe, Lauren M.: *See—*
Green, George D.; Laboe, Lauren M.; and Cook, Richard, 4,641,207, Cl. 360-55.000.

Lach, Horst. Process and device for treatment of metal-bonded nonconductive materials. 4,641,007, Cl. 219-69.00M.

LaFave, Arthur J.: *See—*
Kittle, Carl E.; LaFave, Arthur J.; and Olson, David L., 4,640,368, Cl. 172-430.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Gibot, Claude, 4,640,099, Cl. 62-62.000.

Lake Charles Instruments, Inc.: *See—*
Carpenter, Frank, 4,640,125, Cl. 73-259.000.

Lakes, Sherman, to Day Star Concepts. Coated, heat shrinkable expanded polystyrene. 4,640,862, Cl. 428-308.400.

Lakes, Stephen D.: *See—*
Seitz, Paul W.; Lewis, Maurice W.; and Lakes, Stephen D., 4,641,159, Cl. 346-200.000.

Lakin, Kenneth M.: *See—*
Wang, Jin S.; Lakin, Kenneth M.; and Landin, Allen R., 4,640,756, Cl. 204-192.180.

Lalloz, Paul; and Vo, Hung A., to La Telemecanique Electrique. Process for manufacturing a mold using three-dimensional computer modelling. 4,641,270, Cl. 364-476.000.

Lamond, Lee T.; and Staton, Richard D., to Fichtel & Sachs Industries. Support column with gravity dependent retention means. 4,640,484, Cl. 248-407.000.

Lamot, Jerzy. Wear plate for flush valve assembly. 4,639,951, Cl. 4-392.000.

Lancaster, Gerald M.; Kelley, David C.; Cramm, Russell H.; and Neywick, Charles V., to Dow Chemical Company, The. Barrier film structures. 4,640,865, Cl. 428-421.000.

Landin, Allen R.: *See—*
Wang, Jin S.; Lakin, Kenneth M.; and Landin, Allen R., 4,640,756, Cl. 204-192.180.

Lane, Wendell C., Jr., to Dana Corporation. Multiple function control stalk including pivotable headlight dimmer switch. 4,640,997, Cl. 200-61.540.

Lange, Fred F., to Rockwell International Corporation. Low thermal conductivity Si_3N_4/ZrO_2 composite ceramics. 4,640,902, Cl. 501-97.000.

Lange, Ludwig: *See—*
Bittner, Friedrich; Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; and Splett, Erich, 4,640,832, Cl. 423-562.000.

Langer, Rudolf, to Lindauer Dornier Gesellschaft mbH. Guide track for a tentering chain. 4,639,984, Cl. 26-89.000.

Langham, Barry J.: *See—*
White, Alan C.; Shepherd, Robin G.; and Langham, Barry J., 4,640,924, Cl. 514-291.000.

Lanscioni, Richard. Golf glove. 4,639,947, Cl. 2-161.00A.

La Porte, Allen R. Device for picking up small pieces of litter. 4,640,539, Cl. 294-19.100.

Larsen, Hans-Ole, to Mia-Lens Production A/S. Mold for making contact lenses, either the male or female mold sections being relatively more flexible. 4,640,489, Cl. 249-122.000.

Larson, Curtis L.: *See—*
Isakson, Gary A.; and Larson, Curtis L., 4,640,838, Cl. 426-107.000.

Larson, William A.: *See—*
Soderquist, Mark E.; Muthyala, Ramaiah; Larson, William A.; and Doty, Peter A., 4,640,786, Cl. 252-8.551.

Laser Precision Corporation: *See—*
Hughes, Norman S.; and Doyle, Walter M., 4,640,617, Cl. 356-326.000.

Lashley, Lester; Lashley, R. Craig; and Lashley, Russel E. Armor for motorcyclists. 4,639,944, Cl. 2-2.000.

Lashley, R. Craig: *See—*
Lashley, Lester; Lashley, R. Craig; and Lashley, Russel E., 4,639,944, Cl. 2-2.000.

Lashley, Russel E.: *See—*
Lashley, Lester; Lashley, R. Craig; and Lashley, Russel E., 4,639,944, Cl. 2-2.000.

Lasswell, Patrick G.: *See—*
Phillips, James E.; and Lasswell, Patrick G., 4,640,002, Cl. 29-574.000.

Lathery, Willie M.: *See—*
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Lattion, Andre , to Sulzer Brothers Limited. Automat location system. 4,640,088, Cl. 57-263.000.

Laugesen, Ronald C.; and Venkitakrishnan, Padmanabha I., to Advanced Micro Devices, Inc. Bit-sliced, dual-bus design of integrated circuits. 4,641,247, Cl. 364-490.000.

Laursen, Henning; Mosgaard, John; Nielson, Otto V.; and Poland, Clark L., to Scan Web of North America, Inc. System for producing an air laid web. 4,640,810, Cl. 264-518.000.

Lawrence, Alan J.: *See—*
Van Simaeys, Francoise C. G.; Leurs, Anna M. C.; Upp, Daniel C.; Lawrence, Alan J.; and Cotton, John M., 4,641,301, Cl. 370-58.000.

Lawrence, Ventura J.; Metcalf, Charles G.; and Silva, Lawrence H., to Tractor Plow Co., Inc. Roll-over disc plow. 4,640,367, Cl. 172-225.000.

Lawson, Philip A. Method and apparatus for nondetrimental reduction of infant crying behavior. 4,640,267, Cl. 128-1.00R.

Lazzari, Angelo A.: *See—*
Destree, Xavier P.; and Lazzari, Angelo A., 4,640,648, Cl. 405-229.000.

LeaRonal, Inc.: *See—*
Nobel, Fred I.; and Schram, David N., 4,640,746, Cl. 204-15.000.

LeBlanc Corporation, The: *See—*
LeBlanc, James R., 4,640,563, Cl. 339-32.00M.

LeBlanc, James R., to LeBlanc Corporation, The. Universal clasp structure for external electrode probes. 4,640,563, Cl. 339-32.00M.

Lechon, Alain; and Viard, Alain, to Societe Nationale Elf Aquitaine (Production). Load carrying connection and hydraulic fluid transmission device. 4,640,096, Cl. 60-547.100.

Lecuru, Daniel; and Choffy, Jean-Pierre, to Aerospatiale Societe National Industrielle. Ultrasonic testing device provided with a rolling means. 4,640,133, Cl. 73-639.000.

Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., to United States of America, Energy. Methods for enhancing mapping of thermal fronts in oil recovery. 4,641,099, Cl. 324-323.000.

Lee, Kew-Ho; and Khang, Soon-Jai, to University of Cincinnati. High temperature membrane. 4,640,901, Cl. 501-81.000.

Lee, Shueh-Mien: *See—*
Becker, Scott T.; Bergman, Michael J.; and Lee, Shueh-Mien, 4,641,046, Cl. 307-448.000.

Lee, Yanien: *See—*
Matuszak, Edward A.; Lee, Yanien; and Gillmore, Stephen R., 4,640,843, Cl. 426-560.000.

Leftwich, William B.: *See—*
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,639,953, Cl. 5-43.000.

Leggett & Platt, Incorporated: *See—*
Wells, Thomas J.; and Serafini, Angelo, 4,639,957, Cl. 5-248.000.

Lehmann, Eike; and Jannusch, Reiner, to Howaldtswerke-Deutsche Werft, Aktiengesellschaft. Device for reducing vibrations of periscopes. 4,640,216, Cl. 114-340.000.

Lehner, Rolf P.: *See—*
Pfizenmaier, Wolfgang; Heidt, Heinrich; and Lehner, Rolf P., 4,641,070, Cl. 318-640.000.

Leiber, Heinz: *See—*
Bertling, Hannes; and Leiber, Heinz, 4,640,555, Cl. 303-10.000.

Leibfried, Wolfgang: *See—*
Modic, Fedor; Leibfried, Wolfgang; Nitsch, Manfred; Spitzenberger, Kurt; and Zimmermann, Herbert, 4,640,739, Cl. 156-659.100.

Leigh-Monstevens, Keith V., to Automotive Products plc. Quick connect cylinder mount structure. 4,640,478, Cl. 248-27.100.

Leis, Johann: *See—*
Leitgeb, Paul; Leis, Johann; and Winkler, Dietmar, 4,640,694, Cl. 55-26.000.

Leitgeb, Paul; Leis, Johann; and Winkler, Dietmar, to Linde Aktiengesellschaft. Adsorption process. 4,640,694, Cl. 55-26.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Shan, Tiejun J.; and Kailath, Thomas, 4,641,259, Cl. 364-724.000.

Lembeck, Theo, to W. Schlafhorst & Co. Fiber conducting channel of an OE friction spinning device. 4,640,090, Cl. 57-401.000.

Lemonnier, Jean, to Millipore Corporation. Membrane device for sterility testing. 4,640,777, Cl. 210-433.200.

Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., to Armstrong World Industries, Inc. Mono-sulfonyl azide composition used to photolytically develop a colored image on a cellulosic material. 4,640,885, Cl. 430-197.000.

Lerner, Joseph S.; and Krukas, David, to Loveshaw Corporation, The. Apparatus for taping cartons. 4,640,731, Cl. 156-355.000.

Lerner, Reuben. Combined head rest, sun shade and bag. 4,639,958, Cl. 5-418.000.

Lescha Maschinenfabrik GmbH: *See—*
Schmid, Dieter, 4,640,465, Cl. 241-37.500.

Leuker, Wilhelm; Stipsits, Gunter; and Thiel, Bernhard, to Kraftwerk Union Aktiengesellschaft. Method for finding a leak in pressure-carrying vessels and apparatus for carrying out the method. 4,640,121, Cl. 73-40.50A.

Leurs, Anna M. C.: *See*—
Van Simaeys, Francoise C. G.; Leurs, Anna M. C.; Upp, Daniel C.; Lawrence, Alan J.; and Cotton, John M., 4,641,301, Cl. 370-58.000.
Lever Brothers Company: *See*—
Bunschoten, Gerrit K., 4,640,441, Cl. 222-207.000.
Levino, Andre J., to Westinghouse Electric Corp. Electrical insulation taping machine with uniform tape tensioning. 4,640,086, Cl. 57-3.000.
Levolor Lorentzen, Inc.: *See*—
Georgopoulos, George, 4,639,987, Cl. 29-24.500.
Levy, Zubin. Sensory stimulation enclosure. 4,640,266, Cl. 128-1.00R.
Lew, Hyok S. Edge reinforced cabinet door with built-in door hardwares. 4,640,053, Cl. 49-501.000.
Lewis, George L., to AT&T Information Systems Inc. Wire and cable organizing sleeve. 4,640,032, Cl. 40-316.000.
Lewis, Maurice W.: *See*—
Seitz, Paul W.; Lewis, Maurice W.; and Lakes, Stephen D., 4,641,159, Cl. 346-200.000.
Lewis, Terry D., to Kendall Company, The. Mechanism for proper alignment of sensor probes with fluid sample chamber. 4,640,128, Cl. 73-866.500.
Lewis, Thomas E.: *See*—
Jorgensen, Robert W.; Lewis, Thomas E.; and Kesler, Gregory J., 4,640,433, Cl. 220-266.000.
Leybold-Heraeus GmbH: *See*—
Grein, Lutz; and Matthiensen, Gunter, 4,640,455, Cl. 228-176.000.
Schmidt, Lothar, 4,640,136, Cl. 73-753.000.
Leynadier, Francisque; and Luce, Herve , to Institut Pasteur. Immunoanalysis of basophil-containing blood fraction for diagnosing parasitoses and allergies. 4,640,897, Cl. 436-501.000.
Leyrer, Reinhold J.; Wegner, Gerhard; and Mueller, Michael, to BASF Aktiengesellschaft. Degradation of poly(diacetylenes). 4,640,960, Cl. 525-388.000.
Leytus, Stephen: *See*—
Mangel, Walter F.; Leytus, Stephen; and Melhado, L. Lee, 4,640,893, Cl. 435-23.000.
Lezan, Georges R. E.: *See*—
Walker, Loren H.; and Lezan, Georges R. E., 4,641,231, Cl. 363-58.000.
Liang-Jr Lee: *See*—
Fan, Cheng-Kuo, 4,640,306, Cl. 137-390.000.
Liang, Shwu-Jian: *See*—
Garavuso, Gerald M.; Liang, Shwu-Jian; and Thettu, Raghulinga R., 4,640,504, Cl. 271-113.000.
Lichti, Wayne P.; and Hofstatter, Alfred F., to Metals Ltd. Method of object consolidation employing graphite particulate. 4,640,711, Cl. 75-248.000.
Liff, Walter H. Bird watering apparatus. 4,640,226, Cl. 119-1.000.
Lilly Industries Ltd.: *See*—
Corfield, John R.; and Miller, Andrew S., 4,640,798, Cl. 540-312.000.
Lin, Chi-Hung: *See*—
Kreider, David R.; McCullum, Albert; Rose, Philip M.; and Lin, Chi-Hung, 4,640,963, Cl. 526-67.000.
Lindahl, Thomas G.: *See*—
Gray, Robert R.; and Lindahl, Thomas G., 4,640,682, Cl. 432-58.000.
Lindauer Dornier Gesellschaft mbH: *See*—
Langer, Rudolf, 4,639,984, Cl. 26-89.000.
Linde Aktiengesellschaft: *See*—
Leitgeb, Paul; Leis, Johann; and Winkler, Dietmar, 4,640,694, Cl. 55-26.000.
Linden, Harry A., to Hall Surgical-Division of Zimmer, Inc. Method and apparatus for sterilizing and charging batteries. 4,641,076, Cl. 320-2.000.
Lindenberg, Josef: *See*—
Schnepp-Pesch, Wolfram; and Lindenberg, Josef, 4,640,296, Cl. 128-754.000.
Ling Dynamic Systems Limited: *See*—
Emerson, Andrew C.; and Foster, Stephen A., 4,641,050, Cl. 310-27.000.
Link, Helmut F.; Trautmann, Gunther; and Herrscher, Albert, to Index Werke Komm.-Ges. Hahn & Tessky. Multiple-spindle automatic lathe. 4,640,158, Cl. 82-3.000.
Linnau, Yendra: *See*—
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.
Liu, Christopher S.: *See*—
Kapuscinski, Maria M.; Liu, Christopher S.; Hart, William P.; and Grina, Larry D., 4,640,788, Cl. 252-51.50R.
Liversidge, Barry P. Co-axial cable stripping tool and end portion preparation method. 4,640,009, Cl. 29-828.000.
Livesey, Declan B.; and Toma, Petre, to Texaco Canada Resources Ltd. Bitumen production through a horizontal well. 4,640,359, Cl. 166-276.000.
Lo, K. H.: *See*—
Schmeal, W. R.; Singhal, S. N.; and Lo, K. H., 4,640,853, Cl. 428-35.000.
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., to AT&T Bell Laboratories. Economical high-definition television using a modulated-signal combination. 4,641,179, Cl. 358-12.000.
Lock Jaws, Inc.: *See*—
Ferraro, Thomas A., 4,640,518, Cl. 279-123.000.
Lockhart, Robert K., Jr.: *See*—
Bass, Robert H.; Macko, William J.; and Lockhart, Robert K., Jr., 4,641,364, Cl. 455-32.000.
Lockheed Electronics Co., Inc.: *See*—
Opitz, Charles L.; and Chase, Paul E., 4,641,137, Cl. 342-52.000.
Opitz, Charles L., 4,641,138, Cl. 342-61.000.
Loctite Corporation: *See*—
Jacobine, Anthony F.; and Glaser, David M., 4,640,940, Cl. 522-99.000.
Loctite (Ireland) Limited: *See*—
Woods, John G.; and Rooney, John M., 4,640,849, Cl. 427-54.100.
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, to Sara Lee Corporation. Apparatus for forming and presenting bias cut gussets in the formation of panty hose garments. 4,640,162, Cl. 83-152.000.
Lone Star Industries, Inc.: *See*—
Heitzmann, Richard E.; Fitzgerald, Mark; and Sawyer, James L., 4,640,715, Cl. 106-85.000.
Long, Edward A.: *See*—
Hamilton, James W., Jr.; and Long, Edward A., 4,641,074, Cl. 318-706.000.
Looney, Raymond H., to Baird Manufacturing Company. Overflow vent valve. 4,640,304, Cl. 137-202.000.
Lopata, Herman, to Lopata, Herman. Fraud resistant credit card system. 4,641,017, Cl. 235-457.000.
Lord Corporation: *See*—
Trull, Michael W.; and Powell, Richard C., 4,640,137, Cl. 73-862.040.
Loth, Eric, to Montres RADO SA. Hard metal watch case with a resistant coating. 4,640,869, Cl. 428-469.000.
Lounds, Bernard C. Router attachment. 4,640,324, Cl. 144-134.00D.
Louthan, Rector P.: *See*—
Bresson, Clarence R.; and Louthan, Rector P., 4,640,789, Cl. 252-61.000.
Lovatt, John. Collet chuck. 4,640,517, Cl. 279-2.00R.
Loveshaw Corporation, The: *See*—
Lerner, Joseph S.; and Krukas, David, 4,640,731, Cl. 156-355.000.
Lowe, Anthony E.: *See*—
Meyer, Richard A.; and Lowe, Anthony E., 4,640,138, Cl. 73-862.040.
Lower, Jerry L., to Zimmer, Inc. Bone screw. 4,640,271, Cl. 128-92.0YF.
Lowry, Bobby, to Lowry, June A. Protective bulk pack container for ice cream cones. 4,640,418, Cl. 206-499.000.
Lowry, June A.: *See*—
Lowry, Bobby, 4,640,418, Cl. 206-499.000.
Luce, Herve : *See*—
Leynadier, Francisque; and Luce, Herve , 4,640,897, Cl. 436-501.000.
Lucius, Werner, to Webasto-Werk W. Baier GmbH & Co. Heater, especially a heater for vehicles. 4,640,262, Cl. 126-110.00B.
Luderer, Albert A.: *See*—
Carroll, Richard J.; Luderer, Albert A.; Smith, Ward C.; and Zine, Anthony R., Jr., 4,640,785, Cl. 210-782.000.
Ludwig, Frank, to P.T.E. Inc.; and American Energy Services, Inc. Utility pole tester. 4,640,119, Cl. 73-12.000.
Lugo, Steven H. Signal flag apparatus for water skiing. 4,640,213, Cl. 114-253.000.
Lukianoff, Sergei G. Hand held sanding device. 4,640,060, Cl. 51-391.000.
Lundberg, Robert D.: *See*—
Peiffer, Dennis G.; Kowalik, Ralph M.; and Lundberg, Robert D., 4,640,945, Cl. 523-336.000.
Lundergan, Robert G.; and McClune, Donald W., to AMP Incorporated. Detachable sealed multicontact electrical connector. 4,640,567, Cl. 339-94.00M.
Luoma, Robert P., II; and Willis, Frank M., to Du Pont de Nemours, E. I., and Company. Plasmapheresis filtration module having pressure balancing and sealing means. 4,640,776, Cl. 210-433.200.
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, to Pitney Bowes Inc. Reverse collating machine. 4,640,506, Cl. 271-212.000.
Luvara, Anthony: *See*—
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, 4,640,506, Cl. 271-212.000.
Lysenko, Peter: *See*—
Rush, William F.; Huebler, James E.; and Lysenko, Peter, 4,641,377, Cl. 381-111.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Holzapfel, Klaus, 4,640,190, Cl. 101-348.000.
M C G Plastics Limited: *See*—
Haines, Peter R., 4,640,430, Cl. 215-330.000.
M. Lowenstein Corporation: *See*—
Barnett, Gary A., 4,640,858, Cl. 428-90.000.
MacCarthy, Donald W., Sr. Idler pulley adjuster. 4,640,687, Cl. 474-101.000.
MacDonald, Robert D., to Masco Corporation. Thermostatic valve assembly. 4,640,457, Cl. 236-12.110.
Machida, Mitsuo: *See*—
Nakanowatari, Jun; Machida, Mitsuo; Okamoto, Toshiyuki; and Nakura, Yoshihiro, 4,640,581, Cl. 350-331.00R.
Machine Vision International Corporation: *See*—
Sternberg, Stanley R., 4,641,356, Cl. 382-49.000.
Macierewicz, Jacek J., to ELP Products Ltd. Unplugging of heavy fraction outlet hydrocyclone. 4,640,780, Cl. 210-512.200.

Mackintosh, Charles. System for rolling and unrolling a ground cover. 4,640,469, Cl. 242-55.000.

Macko, William J.: *See*—
Bass, Robert H.; Macko, William J.; and Lockhart, Robert K., Jr., 4,641,364, Cl. 455-32.000.

MacNaughton, Laurence, III: *See*—
Perlman, Eugene H.; and MacNaughton, Laurence, III, 4,641,263, Cl. 364-900.000.

Madey, John M. J.; and Westenskow, Glen A., to Madey, John M. J. Microwave electron gun. 4,641,103, Cl. 328-228.000.

Maeda, Masahiko: *See*—
Suzuki, Masami; Hirota, Tatsuya; and Maeda, Masahiko, 4,640,022, Cl. 34-48.000.

Maeda, Toyohiro: *See*—
Mori, Makihiko; Kibe, Satoshi; and Maeda, Toyohiro, 4,640,761, Cl. 208-44.000.

Maehara, Fuyuky: *See*—
Kato, Hidetoshi; Maehara, Fuyuky; and Mayumi, Nobuo, 4,641,079, Cl. 320-64.000.

Maehara, Toshifumi; and Kurata, Masayuki, to Akebono Brake Industry Company, Ltd. Automatic stop valve device for vehicle brake systems. 4,640,391, Cl. 188-353.000.

Magid, Robert; and Choong, John, to Magid, Robert. Bendable elbow connector. 4,640,642, Cl. 403-157.000.

Magnavox Government and Industrial Electronics Company: *See*—
Diepeveen, Neal; and Bastian, Robert, 4,641,192, Cl. 358-206.000.

Magourou, Yves L., to Societe de Exploitation des Procedes Marechal. Electric cable connector handle. 4,640,568, Cl. 339-103.00R.

Maier, Helmut; Storandt, Ralf; Guenther, Heinz, deceased; by Guenther, Renate, legal representative; and by Guenther, Sabine, legal representative, to Geze GmbH. Adjustment mechanism for tiltable glazed sashes. 4,640,051, Cl. 49-348.000.

Maier, Ludwig: *See*—
Diel, Peter J.; and Maier, Ludwig, 4,640,701, Cl. 71-86.000.

Maixner, Uwe; and Milferstaedt, Dieter, to Gesellschaft Fuer Kernenerg Ieverwertung in Schiffbau und Schiffahat GmbH. Electrical contact. 4,641,002, Cl. 200-268.000.

Makepeace, Richard J.: *See*—
Gabe, Julian; and Makepeace, Richard J., 4,640,705, Cl. 71-93.000.

Makiel, Joseph M., to Westinghouse Electric Corp. Fuel cell generator containing a gas sealing means. 4,640,875, Cl. 429-30.000.

Makino, Masayuki: *See*—
Yotsutani, Akio; Makino, Masayuki; Saegusa, Noboru; and Sone, Tomoshi, 4,640,986, Cl. 379-60.000.

Makino, Takamoto: *See*—
Motoyama, Shimesu; Gotou, Masakazu; Shirakawa, Hiromu; and Makino, Takamoto, 4,640,218, Cl. 118-19.000.

Makino, Takao; and Osada, Shinichi, to Kabushiki Kaisha Morita Seisakusho. Automatic exposure device for a panoramic X-ray photographing device. 4,641,331, Cl. 378-108.000.

Malhi, Satwinder; and Baglee, David A., to Texas Instruments Incorporated. Integrated circuit load device. 4,641,173, Cl. 357-51.000.

Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene fine powder and preparation thereof. 4,640,955, Cl. 524-546.000.

Manby, Alan P.: *See*—
Carter, George B.; and Manby, Alan P., 4,640,724, Cl. 149-109.600.

Mancinelli, Paul A., to Atlantic Richfield Company. Novel coupling agent for star-block copolymers. 4,640,958, Cl. 525-193.000.

Manco Corporation: *See*—
Pravda, Milton F., 4,640,344, Cl. 165-86.000.

Mangel, Walter F.; Leytus, Stephen; and Melhado, L. Lee, to University of Illinois. Novel rhodamine derivatives as fluorogenic substrates for proteinases. 4,640,893, Cl. 435-23.000.

Mannhart, Also: *See*—
Jungwirth, Dieter; and Mannhart, Also, 4,640,068, Cl. 52-223.00L.

Manseth, Robert A. Method and apparatus for aerially transporting loads. 4,640,474, Cl. 244-31.000.

Manspeaker, Edward L. Balance game. 4,640,509, Cl. 273-1.0GF.

Manzinger Papierwerke KG: *See*—
Frank, Helmut, 4,641,360, Cl. 383-15.000.

Marchegiano, Joseph E.; and Baran, Anthony S., to RCA Corporation. System and method for measuring energy transmission through a moving aperture pattern. 4,641,256, Cl. 364-525.000.

Mardon Illingworth, Ltd.: *See*—
Dudzik, Henryk, 4,640,493, Cl. 251-342.000.

Marino, Michael; and Rudis, Thomas C. Tamper-resistant closure. 4,640,427, Cl. 215-232.000.

Mark, Fritz: *See*—
Matt, Lukas; Mark, Fritz; and Gschwend, Hans, 4,640,452, Cl. 227-131.000.

Markel, David: *See*—
McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, 4,639,953, Cl. 5-43.000.

Marker International: *See*—
Sedlmair, Gerhard, 4,640,524, Cl. 280-611.000.

Markert, Gerhard: *See*—
Schnee, Reiner; Pennewiss, Horst; and Markert, Gerhard, 4,640,954, Cl. 524-516.000.

Marocco, Giuseppe, to Technomarmi Maiera S.p.A.; and Seifag S.r.l. Composite slab incorporating a sheet of marble or similar natural stone, for the formation of facings for building, interior decoration and the like. 4,640,850, Cl. 428-15.000.

Marple, Stanley: *See*—
Bannon, Robert P.; and Marple, Stanley, 4,640,743, Cl. 203-87.000.

Marquardt, Susan K.: *See*—
Hansen, Paul E.; and Marquardt, Susan K., 4,640,859, Cl. 428-105.000.

Marsault, Jean-Jacques: *See*—
Semedard, Jean-Claude; Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; and Vallee, Gerard, 4,640,480, Cl. 248-62.000.

Marten, Edward N. Rock saw unit for hard rock earth formations. 4,640,551, Cl. 299-1.000.

Martens, Theodorus G. J. A.; Steenhof, Frits A.; and Kalfs, Johannes J. W., to U.S. Philips Corporation. Data processing system in which unreliable words in the memory are replaced by an unreliability indicator. 4,641,310, Cl. 371-38.000.

Martin, Eugene G.; and Risser, Dale M., to Favorite Manufacturing, Inc. Thigh deboner. 4,639,972, Cl. 17-11.000.

Martin, Frank J.; Hartman, Murray; and Saunders, Randy, to Schlumberger Canada Limited. Snap-fitting transformer terminal cover. 4,640,985, Cl. 174-138.00F.

Martin, Hans, to Suddeutsche Kuhlerfabrik Julius Fr., Behr GmbH & Co. KG. Apparatus for controlling the coolant medium circulation of an internal combustion engine. 4,640,235, Cl. 123-41.030.

Martin, James L.: *See*—
Clark, Roger L.; Ray, Dennis D.; and Martin, James L., 4,641,338, Cl. 379-328.000.

Martin, Robert A.; and Heater, Thomas J., to Ford Motor Company. Foam pattern assembly for use in evaporative casting process. 4,640,333, Cl. 164-246.000.

Martin, Robert A.; and Heater, Thomas J., to Ford Motor Company. Method of joining foam patterns for evaporative casting process. 4,640,728, Cl. 156-245.000.

Martinet, Roland; and Casas, Alain, to Climax France S.A. Modular system of distribution. 4,640,311, Cl. 137-884.000.

Masak, Raymond J., to United States of America, Air Force. Coherent dual automatic gain control system. 4,641,141, Cl. 342-379.000.

Masco Corporation: *See*—
MacDonald, Robert D., 4,640,457, Cl. 236-12.110.

Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Dynamic random access memory with hidden refresh control. 4,641,281, Cl. 365-189.000.

Mason, Daniel P. Truck crane conversion to crawler crane. 4,640,421, Cl. 212-175.000.

Mason, James H. Macpherson strut alignment gauge and straightening apparatus. 4,640,015, Cl. 33-181.0AT.

Massa, Donald P.: *See*—
Massa, Frank; and Massa, Donald P., 4,641,290, Cl. 367-106.000.

Massa, Frank; and Massa, Donald P., to Dellorfano, Fred M., Jr.; and Massa, Donald P. Low frequency portable lightweight sonar systems and their method of deployment for greatly increasing the efficiency of submarine surveillance over large areas. 4,641,290, Cl. 367-106.000.

Massey-Ferguson Inc.: *See*—
Buback, John, 4,640,146, Cl. 74-359.000.

Mastran, David V., to Maximus, Inc. Process for synchronizing computer video with independent audio. 4,641,253, Cl. 364-518.000.

Mastroianni, Anthony R., to RCA Corporation. Analog-to-digital converter with scaling of input signal. 4,641,130, Cl. 340-347.0AD.

Matsubara, Hideo: *See*—
Daido, Toshihiko; Matsubara, Hideo; and Hirakushi, Shuzo, 4,640,380, Cl. 180-141.000.

Matsubara, Noriyuki: *See*—
Sakamoto, Takahide; Hiroshima, Tatsuo; Matsubara, Noriyuki; and Miyata, Kenichi, 4,641,092, Cl. 324-227.000.

Matsuda, Hideki: *See*—
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.

Matsuda, Yukinobu; and Inui, Takayasu, to Kabushiki Kaisha Komatsu Seisakusho. Method of controlling an engine mounted on a construction vehicle. 4,640,245, Cl. 123-339.000.

Matsuhiro, Keiji; and Matsui, Minoru, to NGK Insulators, Ltd. Silicon nitride sintered bodies and a method for producing the same. 4,640,903, Cl. 501-97.000.

Matsui, Kazuhiro, to Kitagawa Industries Co., Ltd. Printed circuit board holding appliance. 4,640,639, Cl. 403-24.000.

Matsui, Minoru: *See*—
Matsuhiro, Keiji; and Matsui, Minoru, 4,640,903, Cl. 501-97.000.

Matsukawa, Yutaka: *See*—
Tsuchiya, Yukio; and Matsukawa, Yutaka, 4,640,381, Cl. 181-144.000.

Matsumoto, Hironori: *See*—
Watanabe, Junichiro; Funahashi, Yuichi; Sugiura, Kazuo; and Matsumoto, Hironori, 4,640,968, Cl. 528-32.000.

Matsumoto, Yukio; and Hanayama, Masaru, to Victor Company of Japan, Ltd. Magnetic recording media. 4,640,863, Cl. 428-323.000.

Matsunaga, Masahiro, to Diesel Kiki Co., Ltd. Fuel injection apparatus for diesel engines. 4,640,241, Cl. 123-198.00F.

Matsuo, Shigeru; and Murakami, Tomoyoshi, to Idemitsu Kosan Company Limited. Polycyanoaryl ether films and fibers. 4,640,974, Cl. 528-211.000.

Matsuo, Shigeru; and Murakami, Tomoyoshi, to Idemitsu Kosan Company Limited. Polycyanoaryl ether and method of preparing the same. 4,640,975, Cl. 528-211.000.

Matsuoka, Tsutomu: *See*—
Nakamura, Saburo; Matsuoka, Tsutomu; Yamauchi, Hirofumi; and Sahara, Masanori, 4,640.252, Cl. 123-446.000.

Matsusaka, Yoshihide, to AMP Incorporated. Electrical connector housing. 4,640,566, Cl. 339-91.00R.

Matsushima, Katsuaki; Fujioka, Yasuhiro; Sasaki, Takeshi; Fujine, Manabu; and Yamamoto, Kouji, to Toyota Jidosha Kabushiki Kaisha. Mounting structure for a roof duct. 4,640,184, Cl. 98-2.150.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fukukita, Hiroshi; Tachita, Ryobun; Fukaya, Kuniaki; and Yano, Tsutomu. 4,641,260, Cl. 364-737.000.
Imanishi, Kiyokazu; Naka, Hiroyuki; Sakurai, Yasuo; Ichiyanagi, Takashi; and Kishimoto, Masaru. 4,641,214, Cl. 360-130.240.
Nakada, Seiichi; Hanada, Tool; and Watanabe, Masao. 4,640,028, Cl. 38-77.700.
Noda, Kazushi; Komatsu, Moriyuki; and Mitsunaga, Hiroshi. 4,640,340, Cl. 165-41.000.

Matsushita Electric Works, Ltd.: *See*—
Abura, Yoshinori; Tsuji, Eiji; Okuyama, Kenji; and Ochi, Shuhei. 4,641,010, Cl. 219-222.000.

Matsushita, Kazuhiro: *See*—
Kamo, Osamu; Ohuchi, Muneki; and Matsushita, Kazuhiro. 4,641,096, Cl. 324-311.000.

Matsushita Seiko Co., Ltd.: *See*—
Takeda, Masaaki. 4,641,053, Cl. 310-317.000.

Matsuura, Takanobu; and Yamamoto, Toshiyuki, to Alps Electric Co., Ltd. Thermal printer. 4,641,150, Cl. 346-76.0PH.

Matsuyama, Noboru: *See*—
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki. 4,641,065, Cl. 318-135.000.

Matt, Lukas; Mark, Fritz; and Gschwend, Hans, to Hilti Aktiengesellschaft. Device for driving nails or similar fastening elements. 4,640,452, Cl. 227-131.000.

Mattei, Riccardo, to G. D. Societa per Azioni. Device for supplying rod-shaped articles, for example cigarettes, to a processing machine. 4,640,656, Cl. 414-303.000.

Mattes, Bernhard; Mausner, Eberhard; and Suchowerskyj, Wadym, to Robert Bosch GmbH. Circuit arrangement for registering false release signals for a restraint system. 4,641,041, Cl. 307-10.00R.

Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., to VMX, Inc. Electronic audio communications systems network. 4,640,991, Cl. 379-88.000.

Matthews, John A.: *See*—
Coburn, Robert E.; and Matthews, John A., 4,640,092, Cl. 60-39.360.

Matthiensen, Gunter: *See*—
Grein, Lutz; and Matthiensen, Gunter, 4,640,455, Cl. 228-176.000.

Matuszak, Edward A.; Lee, Yanies; and Gillmore, Stephen R., to Borden, Inc. Low fat content food chips and method of preparation. 4,640,843, Cl. 426-560.000.

Mauchien, Patrick; and Cauchetier, Philippe, to Commissariat a l'Energie Atomique. Process for the determination of traces of uranium in solution by time resolution spectrofluorimetry. 4,641,032, Cl. 250-459.100.

Mausner, Eberhard: *See*—
Mattes, Bernhard; Mausner, Eberhard; and Suchowerskyj, Wadym, 4,641,041, Cl. 307-10.00R.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Schafer, Fritz P.; Szatmari, Sandor; and Bor, Zsolt, 4,641,312, Cl. 372-25.000.

Maximus, Inc.: *See*—
Mastran, David V., 4,641,253, Cl. 364-518.000.

May, William A. Internally flavored hulled cereal grain and process for preparation. 4,640,842, Cl. 426-534.000.

Mayeur, Jacques, to SEB S.A. Portable cooking appliance comprising an oven chamber and a cooking hotplate. 4,641,015, Cl. 219-386.000.

Maytag Company, The: *See*—
Ross, Frank E.; and Hunter, William H., 4,641,006, Cl. 219-10.55F.

Mayumi, Nobuo: *See*—
Kato, Hidetoshi; Maehara, Fuyuky; and Mayumi, Nobuo, 4,641,079, Cl. 320-64.000.

Mazda Motor Corporation: *See*—
Higashi, Haruki; Yashiki, Seiji; Waki, Kouichirou; and Kikuchi, Toshiyuki. 4,640,394, Cl. 192-3.290.
Nakamura, Saburo; Matsuoka, Tsutomu; Yamauchi, Hirofumi; and Sahara, Masanori. 4,640,252, Cl. 123-446.000.

Mazoff, Stanley S.: *See*—
Fish, Aaron M.; Mazoff, Stanley S.; D'Intino, Adamo M.; and Somasundaram, Hariharan. 4,640,110, Cl. 70-269.000.

Mazumder, Ali T.; and Kamel, Mohamed S., to NCR Corporation. Bar code and reading and decoding device. 4,641,018, Cl. 235-462.000.

McClune, Donald W.: *See*—
Lundergan, Robert G.; and McClune, Donald W., 4,640,567, Cl. 339-94.00M.

McConkey, Stephen E.: *See*—
Patell, Farrokh A.; and McConkey, Stephen E., 4,640,312, Cl. 138-109.000.

McConnell Dowell Constructors Limited: *See*—
Pope, Paul B., 4,640,532, Cl. 285-41.000.

McConnell, Matthew L.; and Gibson, William A., to Raycom Systems, Inc. Fiber optic communication module. 4,641,378, Cl. 455-619.000.

McConway & Torley Corporation: *See*—
Elliott, William O., 4,640,422, Cl. 213-155.000.

McCormick, Stephen J.: *See*—
Quick, David C.; McCormick, Stephen J.; and Ballendux, Gerardus M., 4,640,152, Cl. 74-767.000.

McCown, Robert B.: *See*—
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., 4,641,027, Cl. 250-237.00G.

McCullum, Albert: *See*—
Kreider, David R.; McCullum, Albert; Rose, Philip M.; and Lin, Chi-Hung, 4,640,963, Cl. 526-67.000.

McDaniel, Max P.: *See*—
Johnson, Marvin M.; and McDaniel, Max P., 4,640,964, Cl. 526-134.000.

McDermott, Daniel R. Gravity-conveyor chute section. 4,640,403, Cl. 193-34.000.

McDonnell Douglas Corporation: *See*—
Wear, Frederick C.; and McKinney, Howard F., 4,640,020, Cl. 34-1.000.

McDowell, Allen W.: *See*—
Bryan, Barry L.; Druckerman, Martin; McDowell, Allen W.; Schneider, Ira H.; and Newkirk, Gary L., 4,641,262, Cl. 364-900.000.

McElmurry, Terry J.; Davis, H. Coleman; Leftwich, William B.; and Markel, David, to Coachmen Industries, Inc. Rollover back sofa bed. 4,639,953, Cl. 5-43.000.

McGovern, Stephen J.: *See*—
Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., 4,640,463, Cl. 239-424.000.

McGowan, George A.; and Kaplan, Robert L., to Hughes Aircraft Company. Ribbon termination member. 4,641,288, Cl. 367-20.000.

McIntosh, Harold A., to Robertshaw Controls Company. Protective shield for external parts of a control arrangement. 4,641,223, Cl. 361-424.000.

McKay, Scott A. Garment lock. 4,640,420, Cl. 211-4.000.

McKee, William E.: *See*—
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., 4,640,438, Cl. 220-359.000.

McKibben, Kenneth D.; Gould, Alan P.; Groh, Craig J.; and Wuepper, Thomas E., to Seaton SSK Engineering Inc. Machine for cleaning castings. 4,639,968, Cl. 15-304.000.

McKinney, Howard F.: *See*—
Wear, Frederick C.; and McKinney, Howard F., 4,640,020, Cl. 34-1.000.

McKinney, Richard W.: *See*—
Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., 4,640,676, Cl. 431-54.000.

McLendon, Martin. Motion interconversion apparatus. 4,640,144, Cl. 74-56.000.

McMahon, Raymond D.; Jellovitz, John C.; Vaile, James T.; Renn, Gregory J.; and Ondeck, Elmer J., to Baldwin Technology Corporation. Rotary knife system. 4,640,165, Cl. 83-346.000.

McNair, Rhett, to Scientific Component Systems, Inc. Lamp mounting apparatus and method. 4,641,228, Cl. 362-382.000.

McNamara, James R.; and Piazza, Denis L. Vehicle construction. 4,640,544, Cl. 296-181.000.

McVeigh, Harry A.: *See*—
Green, Gary J.; McVeigh, Harry A.; Penick, Joe E.; and Yan, Tsoung Y., 4,640,675, Cl. 431-2.000.

Meckley, Charles O. Automatic attitude adjuster for kite. 4,640,476, Cl. 244-155.00R.

Mednis, Juris M., to Universal Symetrics Corporation. Multiple variable container package. 4,640,423, Cl. 215-10.000.

Megnint, Lucien, to Neyrpic. Low-head hydroelectric installation. 4,641,040, Cl. 290-52.000.

Meguro, Kanji; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. 1,4-benzothiazine derivatives, compositions containing them and method of use. 4,640,916, Cl. 514-222.000.

Meguro, Kenjiro; Sagawa, Koichiro; Yokota, Hirofumi; and Takehara, Masahiro, to Ajinomoto Co., Inc. Surface modifier for inorganic substances. 4,640,943, Cl. 523-200.000.

Meigne, Christian: *See*—
Keryhuel, Alain; and Meigne, Christian, 4,641,176, Cl. 357-74.000.

Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,640,857, Cl. 428-57.000.

Melgui, Mikhail A.; and Sandomirsky, Sergei G., to Institut Prikladnoi Fiziki Akademii Nauk Beloruskoi SSR. Method and device for magnetic testing of moving elongated ferromagnetic test piece for mechanical properties by utilizing the magnitude of remanent magnetic flux and a pulsed magnetic field. 4,641,093, Cl. 324-239.000.

Melhado, L. Lee: *See*—
Mangel, Walter F.; Leytus, Stephen; and Melhado, L. Lee, 4,640,893, Cl. 435-23.000.

Mentor Corporation: *See*—
Hauser, Thomas M., 4,640,688, Cl. 604-352.000.

MERO-Werke Dr.-Ing Max Mengeringhausen GmbH & Co.: *See*—
Radtke, Manfred, 4,640,854, Cl. 428-35.000.

Merrifield, James H.: *See*—
Ostrozynski, Robert L.; Greene, George H.; and Merrifield, James H., 4,640,962, Cl. 525-474.000.

Metals Ltd.: *See*—
Lichti, Wayne P.; and Hofstatter, Alfred F., 4,640,711, Cl. 75-248.000.

Metcalf, Charles G.: *See*—
Lawrence, Ventura J.; Metcalf, Charles G.; and Silva, Lawrence H., 4,640,367, Cl. 172-225.000.

Metteey, Michel: *See*—
Chaix, Jean-Edmond; and Metteey, Michel, 4,640,537, Cl. 285-368.000.

Meyer, Jack D.: *See*—
Collins, George J.; Rocca, Jorge J.; and Meyer, Jack D., 4,641,316, Cl. 372-74.000.
Meyer, Jeffry R.: *See*—
Crookston, Ronald W.; and Meyer, Jeffry R., 4,641,000, Cl. 200-148.00R.
Meyer, Richard A.; and Lowe, Anthony E., to MTS Systems Corporation. Multiple axis load sensitive transducer. 4,640,138, Cl. 73-862.040.
Meyer, Steven D.; and Raven, Peter B., to Texas College of Osteopathic Medicine. Self-contained breathing apparatus. 4,640,277, Cl. 128-204.230.
Meyman, Usher. Rotary engine. 4,640,242, Cl. 123-246.000.
Mia-Lens Production A/S: *See*—
Larsen, Hans-Ole, 4,640,489, Cl. 249-122.000.
Michalik, John K., to Cambridge Instrument Company plc, The. Automatic refractometer. 4,640,616, Cl. 356-136.000.
Michel, Alain H.: *See*—
Blancheton, Jean-Paul; Calvas, Jacques; Michel, Alain H.; and Vonau, Vincent, 4,640,227, Cl. 119-2.000.
Michel, Pierre. Process for the preparation of cellular products and laminates based on furan prepolymers. 4,640,934, Cl. 521-103.000.
Micro Storage Ltd.: *See*—
Smith, Robert R., II, 4,641,209, Cl. 360-86.000.
Migliore, Neil. Assembly system with clip for installing marble panels. 4,640,076, Cl. 52-509.000.
Mihata, Ichiro: *See*—
Mitani, Tomomasa; and Mihata, Ichiro, 4,640,966, Cl. 526-249.000.
Mikalsen, Arthur, to Exxon Printing Systems, Inc. Ink jet apparatus with reservoir having a tilt valve serving as fill port and air vent. 4,641,154, Cl. 346-140.00R.
Mikami, Katsumasa: *See*—
Suzaki, Masafumi; Mikami, Katsumasa; Nagano, Yousuke; and Kitagishi, Tomoji, 4,641,149, Cl. 346-76.0PH.
Miko, Stephen J.: *See*—
Puchala, Ryszard J.; and Miko, Stephen J., 4,640,644, Cl. 404-75.000.
Milferstaedt, Dieter: *See*—
Maixner, Uwe; and Milferstaedt, Dieter, 4,641,002, Cl. 200-268.000.
Miller, Andrew S.: *See*—
Corfield, John R.; and Miller, Andrew S., 4,640,798, Cl. 540-312.000.
Miller, Dolores C.: *See*—
Alnot, Patrick R.; Auerbach, Daniel J.; Brundle, Christopher R.; and Miller, Dolores C., 4,640,718, Cl. 134-2.000.
Miller, Gary R.; and Gilson, Richard E., to Eastman Kodak Company. Subbed lithographic printing plate. 4,640,886, Cl. 430-271.000.
Miller, Glen E., to Boeing Company, The. System for determining the position of the boundary between substances having different refractive indices. 4,641,025, Cl. 250-227.000.
Miller, Granville G.: *See*—
Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., 4,640,006, Cl. 29-623.100.
Miller, Harry: *See*—
Zweifel, Terry L.; and Miller, Harry, 4,641,268, Cl. 364-440.000.
Miller, Richard L. Apparatus for storing and relating visual data and computer information. 4,641,203, Cl. 358-335.000.
Miller, Ronald E.: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, 4,640,719, Cl. 134-40.000.
Miller, Thomas M.: *See*—
Schraff, Raymond J.; Miller, Thomas M.; and Labas, Nicholas, 4,640,202, Cl. 110-336.000.
Miller, William J., to Racal Data Communications Inc. High speed packet switching arrangement. 4,641,302, Cl. 370-60.000.
Milliken Research Corporation: *See*—
Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., 4,640,690, Cl. 8-506.000.
Millipore Corporation: *See*—
Lemonnier, Jean, 4,640,777, Cl. 210-433.200.
Milthorpe, Bruce K.: *See*—
Farrell, Peter C.; Bertram, Christopher D.; and Milthorpe, Bruce K., 4,640,896, Cl. 436-34.000.
Milton, Bruce F.: *See*—
Blosser, Henry G.; and Milton, Bruce F., 4,641,057, Cl. 313-62.000.
Mimoto, Toshio: *See*—
Sato, Ryoichi; and Mimoto, Toshio, 4,641,081, Cl. 323-313.000.
Minato, Osamu: *See*—
Sasaki, Yukio; Nishimura, Kotaro; and Minato, Osamu, 4,641,285, Cl. 365-210.000.
Mine, Susumu; and Ishizaka, Takao, to Tokyo Shibaura Denki Kabushiki Kaisha. Superconducting magnet and method of manufacture thereof. 4,640,005, Cl. 29-599.000.
Minister for Industry and Decentralization of the State of New South Wales, The: *See*—
Krilov, Alexandre, 4,640,327, Cl. 144-340.000.
Minnesota Mining and Manufacturing Company: *See*—
Craighead, Lawrence W., 4,640,289, Cl. 128-639.000.
Hansen, Paul E.; and Marquardt, Susan K., 4,640,859, Cl. 428-105.000.
Isakson, Gary A.; and Larson, Curtis L., 4,640,838, Cl. 426-107.000.
Janssen, Jeffrey R., 4,640,727, Cl. 156-240.000.
Kilbane, George J.; and Subrahmanian, K. P., 4,640,978, Cl. 174-23.00R.
Minolta Camera Kabushiki Kaisha: *See*—
Oka, Tateki, 4,640,883, Cl. 430-122.000.
Yasumoto, Hitoshi; and Tanimoto, Tetsuyuki, 4,640,609, Cl. 355-37.000.
Mirsky, Saul: *See*—
Staroselsky, Naum; and Mirsky, Saul, 4,640,665, Cl. 415-1.000.
Misco, Peter F., Jr.: *See*—
Kim, Choung U.; and Misco, Peter F., Jr., 4,640,799, Cl. 540-350.000.
Mita Industrial Co., Ltd.: *See*—
Kozuka, Nobuhiko; Koyama, Shigeo; and Kano, Atsushi, 4,640,604, Cl. 355-3.00R.
Mitani, Tomomasa; and Mihata, Ichiro, to Dainippon Ink and Chemicals, Inc. Fluoroolefin copolymer, process for production thereof and composition containing said copolymer. 4,640,966, Cl. 526-249.000.
Mitchell, Donald L., to United States of America, Navy. Test set for a navigational satellite receiver. 4,641,254, Cl. 364-580.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujihisa, Hiroaki; Fujii, Hiroshi; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,641,001, Cl. 200-153.00G.
Iwatani, Shiro, 4,641,172, Cl. 357-48.000.
Kamaike, Hiroshi, 4,640,389, Cl. 187-119.000.
Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, 4,641,281, Cl. 365-189.000.
Shimotori, Kazuhiro; Fujishima, Kazuyasu; Ozaki, Hideyuki; and Miyatake, Hideshi, 4,641,286, Cl. 365-230.000.
Suzuki, Mamoru; and Fukui, Shinta, 4,641,248, Cl. 364-492.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Oe, Tsutomu; Kimura, Shigeaki; Yuzaki, Yoshinori; and Ozaki, Tadao, 4,640,453, Cl. 228-17.700.
Mitsubishi Paper Mills, Ltd.: *See*—
Kagota, Nobuhiro; and Senoh, Hideaki, 4,640,714, Cl. 106-21.000.
Mitsudera, Hiroyuki; Konishi, Kazuo; and Sato, Yasuo, to Takeda Chemical Industries, Ltd. Insecticidally, acaricidally, and nematocidally 2-amino-1,3-dithiane derivatives and pesticidal compositions therefor. 4,640,929, Cl. 514-436.000.
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, to Canon Kabushiki Kaisha. Image forming method of negative latent images using silica particles. 4,640,882, Cl. 430-110.000.
Mitsui, Akio: *See*—
Fujita, Munehisa; and Mitsui, Akio, 4,640,890, Cl. 430-504.000.
Mitsui Mining and Smelting Co., Ltd.: *See*—
Ueno, Kuniki; and Takahashi, Naotomi, 4,640,747, Cl. 204-37.100.
Mitsunaga, Hiroshi: *See*—
Noda, Kazushi; Komatsu, Moriyuki; and Mitsunaga, Hiroshi, 4,640,340, Cl. 165-41.000.
Miura, Minoru: *See*—
Kajimura, Haruhiko; Nagano, Hiroo; and Miura, Minoru, 4,640,817, Cl. 420-50.000.
Miyagi, Ken, to Canon Kabushiki Kaisha. Image processing method or apparatus. 4,641,197, Cl. 358-280.000.
Miyagi, Ken, to Canon Kabushiki Kaisha. Image reading apparatus. 4,641,199, Cl. 358-285.000.
Miyakawa, Seiichi; Tatsuni, Susumu; and Sakamoto, Koji. Method and apparatus for detecting toner concentration of two-component dry developer. 4,640,129, Cl. 73-866.000.
Miyamoto, Hiroshi: *See*—
Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, 4,641,281, Cl. 365-189.000.
Miyamoto, Shoji: *See*—
Yabushita, Masaharu; Nohmi, Makoto; Fujikura, Nobuyuki; Miyamoto, Shoji; and Ihara, Hirokazu, 4,641,237, Cl. 364-200.000.
Miyata, Kenichi: *See*—
Sakamoto, Takahide; Hiroshima, Tatsuo; Matsubara, Noriyuki; and Miyata, Kenichi, 4,641,092, Cl. 324-227.000.
Miyatake, Hideshi: *See*—
Shimotori, Kazuhiro; Fujishima, Kazuyasu; Ozaki, Hideyuki; and Miyatake, Hideshi, 4,641,286, Cl. 365-230.000.
Miyazawa, Yoshiaki, to Kabushiki Kaisha Toshiba. Power supply system and a control method thereof. 4,641,042, Cl. 307-66.000.
Miyoshi, Akio; and Fukami, Akira, to Sumitomo Metal Mining Co., Ltd. Hermetic sealing cover and a method of producing the same. 4,640,436, Cl. 220-359.000.
Miyoshi, Katsuyoshi: *See*—
Terano, Minoru; Yokoyama, Yasushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,640,906, Cl. 502-104.000.
Miyoshi, Masanobu: *See*—
Komorita, Kazuo; Miyoshi, Masanobu; and Onodera, Kaoru, 4,640,889, Cl. 430-505.000.
Mizoguchi, Saburo, to Sharp Kabushiki Kaisha. Humidifier blowoff portion. 4,640,804, Cl. 261-81.000.
Mizuhashi, Mamoru: *See*—
Oyama, Takuji; and Mizuhashi, Mamoru, 4,640,867, Cl. 428-432.000.
Mizukado, Masayoshi; Morishita, Akio; and Muto, Yoshihiro, to Yamazaki Machinery Works, Ltd. Turret punch press. 4,640,166, Cl. 83-552.000.

Mizunoe, Katsumi; Yanai, Junichi; and Kimoto, Kiyoshi, to Nippon Kogaku K.K. Optical head for information recording apparatus. 4,641,296, Cl. 369-46.000.

Mizusawa, Nobutoshi: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.

Mo och Domsjo Aktiebolag: *See*—
Careborg, Bengt R., 4,640,282, Cl. 128-360.000.

Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,640,692, Cl. 44-1.0SR.
Chou, Tai-Sheng, 4,640,763, Cl. 208-78.000.
Green, Gary J.; McVeigh, Harry A.; Penick, Joe E.; and Yan, Tsoung Y., 4,640,675, Cl. 431-2.000.
Herrington, Fox J., 4,640,640, Cl. 403-57.000.
Jones, Lloyd G., 4,640,357, Cl. 166-273.000.
Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., 4,640,463, Cl. 239-424.000.
Neeley, Walter P., 4,641,287, Cl. 367-19.000.
Page, Ronald D., 4,640,552, Cl. 299-24.000.
Rubin, Mae K., 4,640,829, Cl. 423-328.000.
Sampath, Krishnaswamy, 4,640,358, Cl. 166-274.000.

Mobley, Joseph G., II, to Scientific Atlanta, Inc. Signal to noise ratio enhancement using baseband signals in an FM television system. 4,641,181, Cl. 358-36.000.

Mobley, Lawrence R.; and Gregg, James S., to Samsonite Corporation. Locking trolley for garment bag with improved hanger retention. 4,640,414, Cl. 206-287.000.

Mochida, Kenichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, to Kyowa Hakko Kogyo Co., Ltd. 3-substituted carbacepem compounds having antibacterial effect. 4,640,919, Cl. 514-241.000.

Mochizuki, Manabu: *See*—
Ariyama, Kenzo; Kurotori, Tsuneo; and Mochizuki, Manabu, 4,640,605, Cl. 355-4.000.

Mochizuki, Masfumi: *See*—
Kato, Shigeru; Osada, Naomi; Ichitoh, Toshikatsu; Murata, Masae; and Mochizuki, Masfumi, 4,641,151, Cl. 346-76.0PH.

Mock, Donald E., to Kirkhill Rubber Company. Enclosed conduit. 4,640,314, Cl. 138-162.000.

Modern Mfg. Co. Inc.: *See*—
Stuck, Matthew A., 4,640,079, Cl. 53-390.000.

Modic, Fedor; Leibfried, Wolfgang; Nitsch, Manfred; Spitzenberger, Kurt; and Zimmermann, Herbert, to Robert Bosch GmbH. Process of producing galvanic layers of solder of precise contour on inorganic substrates. 4,640,739, Cl. 156-659.100.

Mody, Dinesh I.; Rasmussen, James E.; and Ryaboy, Mikhail Y., to Fisher Scientific Company. Analysis apparatus. 4,640,821, Cl. 422-81.000.

Moffat, Ian. Method of adding extra floors on existing buildings. 4,640,070, Cl. 52-236.300.

Mohacsi, Erno; and O'Brien, Jay P., to Hoffmann-La Roche Inc. Naphtho(1,8-bc)-1,5-thiazocinones. 4,640,930, Cl. 514-431.000.

Molloy, James J.: *See*—
Dyer, Stanley; Molloy, James J.; Nguyen, Thoi; Riherd, David M.; Voit, William F., Jr.; and West, Donald L., 4,641,148, Cl. 346-76.0PH.

Monarch Tool & Manufacturing Company: *See*—
Hall, Mitchell A., 4,640,405, Cl. 194-235.000.

Monash University: *See*—
Tobin, Roderick C.; and Perry, Nigel D., 4,641,313, Cl. 372-56.000.

Monen, Marinus J. B. M.: *See*—
Furukawa, Shunsuke; Suzuki, Tadao; and Monen, Marinus J. B. M., 4,641,295, Cl. 369-32.000.

Monett, Edward. Springless diaphragms and method of producing same. 4,640,272, Cl. 128-127.000.

Monomakhoff, Nicolas: *See*—
Carminati, Armelle; de Buyer, Edouard; Monomakhoff, Nicolas; and Chanut, Roland, 4,639,955, Cl. 5-81.00B.

Monsanto Company: *See*—
Beestman, George B., 4,640,709, Cl. 71-100.000.
Grabiak, Raymond C.; Howe, Robert K.; and Schafer, David E., 4,640,702, Cl. 71-90.000.

Montijo, Robert. Super memory educational game of skill and chance. 4,640,513, Cl. 273-249.000.

Montini, Charles, Jr., to RCA Corporation. Overpower protection for a radio frequency transceiver. 4,641,365, Cl. 455-78.000.

Montoya, Paul C.: *See*—
Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., 4,641,099, Cl. 324-323.000.

Montres RADO SA: *See*—
Loth, Eric, 4,640,869, Cl. 428-469.000.

Moog Inc.: *See*—
Cummins, Richard D., 4,641,072, Cl. 318-687.000.

Moore, James G.; Obey, James H.; and Pinkel, Edward B., to Blaw Knox Corporation. Apparatus for evaporative stripping. 4,640,740, Cl. 159-13.100.

Moore, John F., to Kabushiki Kaisha Toshiba. Laminar magnet for magnetic resonance device and method of making same. 4,641,119, Cl. 335-297.000.

Moore, Patrick D.: *See*—
Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., 4,640,690, Cl. 8-506.000.

Moore, Richard C.: *See*—
Strunk, Richard J.; and Moore, Richard C., 4,640,927, Cl. 514-342.000.

Moore, Robert W.; and Azzopardi, Michael J. Carton loading method and system. 4,640,657, Cl. 414-347.000.

Moraly, Paul, to Sarkis S.A. Process and tool for boring cavity holes, more especially in concrete plaster or similar walls. 4,640,371, Cl. 175-61.000.

Morbioli, Rene J.; and Ney, Jean C., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation - S.N.E.C.M.A. Elutriation apparatus for the purification and separation of powders of different densities. 4,640,768, Cl. 209-37.000.

Mori, Giorgio B. Kiln for firing heavy ceramics. 4,640,683, Cl. 432-134.000.

Mori, Makihiko; Kibe, Satoshi; and Maeda, Toyohiro, to Osaka Gas Company Limited. Process for preparing pitch. 4,640,761, Cl. 208-44.000.

Mori, Masaaki; Sano, Akira; Horiuchi, Yushi; and Okumura, Yoshihiro, to Director General of Agency of Industrial Science and Technology. Apparatus for manufacturing powdered silicon nitride. 4,640,023, Cl. 34-57.00A.

Mori, Yasuki: *See*—
Kawanishi, Tsuneaki; Mori, Yasuki; Noguchi, Koji; and Iimura, Tsutomu, 4,640,880, Cl. 430-106.600.

Morishita, Akio: *See*—
Mizukado, Masayoshi; Morishita, Akio; and Muto, Yoshihiro, 4,640,166, Cl. 83-552.000.

Morita, Kouichi: *See*—
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,640,707, Cl. 71-96.000.

Moriwaki, Hisayoshi: *See*—
Nakano, Kenji; and Moriwaki, Hisayoshi, 4,641,309, Cl. 371-31.000.

Moriyama, Norio: *See*—
Itoh, Yoshio; Ohtsuka, Hiroshi; Nishimuro, Tadashi; and Moriyama, Norio, 4,640,888, Cl. 430-323.000.

Moriyasu, Makoto: *See*—
Kokubu, Yoshinori; and Moriyasu, Makoto, 4,640,900, Cl. 501-67.000.

Morooka, Yoshikazu: *See*—
Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, 4,641,281, Cl. 365-189.000.

Morris, Robert A.; and Rajotte, Paul T., to General Electric Company. Signal processor module for ground fault circuit breaker. 4,641,216, Cl. 361-45.000.

Morris, Robert A.; Rajotte, Paul T.; Russell, Ronald R.; and Kiesel, George W., to General Electric Company. Two pole ground fault circuit breaker. 4,641,217, Cl. 361-45.000.

Mortenson, Robert L.: *See*—
Coulthart, Kenneth B.; Fairfield, Robert C.; and Mortenson, Robert L., 4,641,102, Cl. 328-62.000.

Morton Thiokol GmbH: *See*—
Romer, Manfred; Woletz, Peter; and Kruger, Klaus, 4,640,938, Cl. 522-79.000.

Morton Thiokol Inc.: *See*—
Penn, Howard I., 4,640,868, Cl. 428-446.000.

Moser, Peter: *See*—
Conrad, Ulrich; Moser, Peter; and Gruber, Gerhard, 4,640,256, Cl. 123-568.000.

Mosgaard, John: *See*—
Laursen, Henning; Mosgaard, John; Nielson, Otto V.; and Poland, Clark L., 4,640,810, Cl. 264-518.000.

Motegi, Nawoto: *See*—
Nagasaka, Hiroko; and Motegi, Nawoto, 4,640,737, Cl. 156-643.000.

Motorola, Inc.: *See*—
Bass, Robert H.; Macko, William J.; and Lockhart, Robert K., Jr., 4,641,364, Cl. 455-32.000.
Birrittella, Mark S., 4,641,047, Cl. 307-454.000.
Derfiny, Dennis J.; van den Heuvel, Anthony P.; and Edguer, Nihat S., 4,641,222, Cl. 361-403.000.

Motoyama, Shimesu; Gotou, Masakazu; Shirakawa, Hiromu; and Makino, Takamoto, to Freund Industrial Co., Ltd. Tablet coating apparatus. 4,640,218, Cl. 118-19.000.

Moulin, Jean-Francois: *See*—
Badin, Suzan; Moulin, Jean-Francois; Delattre, Luc; and Renan, Patrice, 4,640,055, Cl. 51-101.0LG.

MTS Systems Corporation: *See*—
Meyer, Richard A.; and Lowe, Anthony E., 4,640,138, Cl. 73-862.040.

Mueller, Michael: *See*—
Leyrer, Reinhold J.; Wegner, Gerhard; and Mueller, Michael, 4,640,960, Cl. 525-388.000.

Mueller, Walter B.: *See*—
Ferguson, Daniel J.; Schirmer, Henry G.; and Mueller, Walter B., 4,640,856, Cl. 428-36.000.

Muhle, Manfred. Multipart thermally insulated metal profile for facade structures or roof structures. 4,640,072, Cl. 52-403.000.

Mukasa, Koichi: *See*—
Shimada, Yutaka; Hatanai, Takashi; Mukasa, Koichi; and Nakashima, Keishi, 4,641,213, Cl. 360-125.000.

Mullen, Michael J., to Northwestern Steel and Wire Company. Shroud for furnace electrode. 4,641,320, Cl. 373-96.000.

Muller, Charles B., to C. Muller & Associates, Inc. Protective dispensing assembly for ultrapure liquids. 4,641,362, Cl. 383-115.000.

Muller, Otmar: *See*—
Berg, Gunter; Muller, Otmar; and Esters, Rainer, 4,640,947, Cl. 524-109.000.
Multiflex International, Inc.: *See*—
Douglas, Larry D., 4,640,163, Cl. 83-175.000.
Munir, Mohammad, to Suddeutsche Zucker-Aktiengesellschaft. Production of isomaltulose using immobilized microorganisms. 4,640,894, Cl. 435-100.000.
Munson, Robert D., to Emerson Electric Co. Solid state ballast for gaseous discharge lamps. 4,641,061, Cl. 315-210.000.
Murakami, Hideo; and Kobayashi, Takehiro, to Ryobi Ltd. Clutch releasing and braking mechanism for fishing reel. 4,640,471, Cl. 242-84.530.
Murakami, Koji: *See*—
Iizawa, Ryuji; and Murakami, Koji, 4,641,067, Cl. 318-287.000.
Murakami, Tomoyoshi: *See*—
Matsuo, Shigeru; and Murakami, Tomoyoshi, 4,640,974, Cl. 528-211.000.
Matsuo, Shigeru; and Murakami, Tomoyoshi, 4,640,975, Cl. 528-211.000.
Murakawa, Kazunori: *See*—
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,640,882, Cl. 430-110.000.
Murasugi, Takashi; Suga, Masaaki; and Niikura, Yasuhiro, to Nissan Motor Company, Limited. Slip control mechanism for friction clutch in torque converter of automatic power transmission. 4,640,395, Cl. 192-3.310.
Murata Manufacturing Co., Ltd.: *See*—
Tanaka, Yasuhiro, 4,641,055, Cl. 310-368.000.
Murata, Masae: *See*—
Kato, Shigeru; Osada, Naomi; Ichitoh, Toshikatsu; Murata, Masae; and Mochizuki, Masfumi, 4,641,151, Cl. 346-76.0PH.
Murphy, Robert: *See*—
Kelly, Patrick S.; Oswald, Thomas; Jeal, Alan J.; Hill, Stephen E.; and Murphy, Robert, 4,641,372, Cl. 455-601.000.
Murray, Leroy J.; Olson, Lawrence N.; Chavoya, Robert; and Wade, James. Cylinder assembly covering remover. 4,640,735, Cl. 156-584.000.
Musha, Kazuhiko; Tago, Kohichi; and Kato, Hidetoshi, to Sony Corporation. Metal ring preventing implosion of cathode-ray tube. 4,641,196, Cl. 358-246.000.
Musikant, Solomon: *See*—
Hillig, William B.; and Musikant, Solomon, 4,640,899, Cl. 501-5.000.
Hillig, William B.; and Musikant, Solomon, 4,640,904, Cl. 501-128.000.
Musto, Richard L.; and Dunn, Mark R., to Combustion Engineering, Inc. Roller mill control system. 4,640,464, Cl. 241-34.000.
Musumeci, Salvatore: *See*—
Bertotti, Franco; Ferla, Giuseppe; Musumeci, Salvatore; and Raciti, Salvatore, 4,641,171, Cl. 357-46.000.
Muta, Tomonobu: *See*—
Nakamura, Chiaki; Oe, Koji; Muta, Tomonobu; Sasaki, Toshiki; and Nishio, Yoshihiro, 4,640,887, Cl. 430-275.000.
Muthyala, Ramaiah: *See*—
Soderquist, Mark E.; Muthyala, Ramaiah; Larson, William A.; and Doty, Peter A., 4,640,786, Cl. 252-8.551.
Muto, Yoshihiro: *See*—
Mizukado, Masayoshi; Morishita, Akio; and Muto, Yoshihiro, 4,640,166, Cl. 83-552.000.
Myllyla , Risto; Kopola, Harri; Kostamovaara, Juha; and Ahola, Raimo, to Noptel Ky. Optoelectronic target practice apparatus. 4,640,514, Cl. 273-310.000.
N.I.T. Co., Ltd.: *See*—
Nakanishi, Wataru, 4,640,649, Cl. 405-237.000.
Naaijer, Geert J., to U.S. Philips Corporation. Device for selectively connecting between parallel paths and a common path. 4,640,995, Cl. 200-11.0DA.
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, to BASF Aktiengesellschaft. Electrically conductive pyrrole copolymers and their preparation. 4,640,749, Cl. 204-59.00R.
Nagai, Masayuki: *See*—
Hayashi, Motomu; Nagai, Masayuki; and Akoshima, Shigeru, 4,640,066, Cl. 52-208.000.
Nagai, Takaatsu; Takada, Masayuki; Sato, Akira; and Imamura, Mineo, to Nippon Steel Corporation. Method for quantitative discharge of molten material. 4,641,319, Cl. 373-84.000.
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, to Sumitomo Chemical Company, Ltd. Tetrahydrophthalimides and their herbicidal use. 4,640,707, Cl. 71-96.000.
Nagano, Hiroo: *See*—
Kajimura, Haruhiko; Nagano, Hiroo; and Miura, Minoru, 4,640,817, Cl. 420-50.000.
Nagano, Yousuke: *See*—
Suzaki, Masafumi; Mikami, Katsumasa; Nagano, Yousuke; and Kitagishi, Tomoji, 4,641,149, Cl. 346-76.0PH.
Nagasaka, Hiroko; and Motegi, Nawoto, to Kabushiki Kaisha Toshiba. Dry etching method of compound semiconductor. 4,640,737, Cl. 156-643.000.
Nagasawa, Yoshiaki: *See*—
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki, 4,641,065, Cl. 318-135.000.
Nagashima, Shigeo: *See*—
Hatakeyama, Yasuhiko; and Nagashima, Shigeo, 4,641,275, Cl. 364-900.000.
Nagata, Masami; Yanase, Sumio; and Setaka, Yousuke, to Nippondenso Co., Ltd. Control apparatus for brushless motor. 4,641,066, Cl. 318-254.000.
Naka, Hiroyuki: *See*—
Imanishi, Kiyokazu; Naka, Hiroyuki; Sakurai, Yasuo; Ichiyanagi, Takashi; and Kishimoto, Masaru, 4,641,214, Cl. 360-130.240.
Nakada, Seiichi; Hanada, Tool; and Watanabe, Masao, to Matsushita Electric Industrial Co., Ltd. Combination steam iron and steamer. 4,640,028, Cl. 38-77.700.
Nakagawa, Takeo; and Suzuki, Kiyoshi, to Research Development Corp.; and Aisin Seiki Kabushiki Kaisha. Production of short metal fibers. 4,640,156, Cl. 82-1.00C.
Nakahara, Tsuguji: *See*—
Shimizu, Kimihiro; Nakahara, Tsuguji; Kinoshita, Taketoshi; Takatsuka, Jun; and Igarashi, Michiko, 4,640,835, Cl. 424-94.000.
Nakai, Ken: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.
Nakai, Toshihiko; and Kaneko, Masahiko, to Citizen Watch Co., Ltd. Method for inhibiting printing during ribbon reversal. 4,640,635, Cl. 400-664.000.
Nakamoto, Takayuki, to Iwata Electric Works Co., Ltd. Surgical needle extractor having a disposable chuck, a chuck and a handle. 4,640,274, Cl. 128-321.000.
Nakamura, Chiaki; Oe, Koji; Muta, Tomonobu; Sasaki, Toshiki; and Nishio, Yoshihiro, to Dainippon Ink and Chemicals, Inc. Photosensitive image-forming material comprised of carboxyl groups developable in aqueous alkaline base solutions. 4,640,887, Cl. 430-275.000.
Nakamura, Michihiro: *See*—
Gion, Hidenori; Kubota, Kenji; Nakamura, Michihiro; and Yano, Makoto, 4,641,249, Cl. 364-496.000.
Nakamura, Naotaka: *See*—
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, 4,640,996, Cl. 200-19.00R.
Nakamura, Saburo; Matsuoka, Tsutomu; Yamauchi, Hirofumi; and Sahara, Masanori, to Mazda Motor Corporation. Fuel injection system for diesel engine. 4,640,252, Cl. 123-446.000.
Nakamura, Yoshiyuki; Kato, Tetsuro; and Ebihara, Norio, to Sony Corporation. Skip field color recording apparatus. 4,641,202, Cl. 358-313.000.
Nakane, Mototaka; and Tanaka, Shizuo, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Automatic wear compensation mechanism. 4,640,400, Cl. 192-70.250.
Nakanishi, Wataru, to N.I.T. Co., Ltd. Method and apparatus for forming an underground solidification structure. 4,640,649, Cl. 405-237.000.
Nakano, Hideaki; and Ozu, Tadahiro, to Kawasaki Jukogyo Kabushiki Kaisha. Liquid-cooled cylinder assembly in internal-combustion engine. 4,640,236, Cl. 123-41.790.
Nakano, Kenji; and Moriwaki, Hisayoshi, to Sony Corporation. Method and apparatus for selectively compensating burst errors of variable length in successive digital data words. 4,641,309, Cl. 371-31.000.
Nakano, Tomio: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,641,166, Cl. 357-23.600.
Nakano, Yoshito: *See*—
Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, 4,641,156, Cl. 346-160.000.
Nakanowatari, Jun; Machida, Mitsuo; Okamoto, Toshiyuki; and Nakura, Yoshihiro, to Alps Electric Co., Ltd. Flexible printed circuit board for a display device. 4,640,581, Cl. 350-331.00R.
Nakaoka, Sadaaki: *See*—
Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, 4,640,597, Cl. 353-79.000.
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, to Sumitomo Rubber Industries, Ltd. Radial tire for motorcycles. 4,640,329, Cl. 152-209.00R.
Nakashima, Keishi: *See*—
Shimada, Yutaka; Hatanai, Takashi; Mukasa, Koichi; and Nakashima, Keishi, 4,641,213, Cl. 360-125.000.
Nakayama, Masanobu: *See*—
Goto, Hajime; Amemiya, Ikuzo; Nakayama, Masanobu; and Hatano, Yoshinobu, 4,639,988, Cl. 29-25.350.
Nakazawa, Mitsunobu: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.
Nakura, Yoshihiro: *See*—
Nakanowatari, Jun; Machida, Mitsuo; Okamoto, Toshiyuki; and Nakura, Yoshihiro, 4,640,581, Cl. 350-331.00R.
Namur, Marc, to Schutz-Werke GmbH & Co. KG. Adjustment fixture for wishbone booms board-sailing devices. 4,640,211, Cl. 114-97.000.
Nanda, Madan M.: *See*—
Fredericks, Edward C.; and Nanda, Madan M., 4,640,738, Cl. 156-656.000.
Nash, Henry G. Means for securing tubes to a tube sheet. 4,640,192, Cl. 102-307.000.
National Nuclear Corporation Limited: *See*—
Dearden, Guy L.; and Hayden, Owen, 4,640,343, Cl. 165-70.000.
National Research Development Corporation: *See*—
Turner, Michael J. B.; Hanley, Michael; and Hartwell, Eric S., 4,640,231, Cl. 119-155.000.

Naumanen, Esko: *See—*
Hetemaa, Kalevi; Naumanen, Esko; and Vainio, Frans, 4,640,459, Cl. 238-122.000.
Naumann, Reinhard, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Sheet-separating and conveying suction device. 4,640,503, Cl. 271-103.000.
NCR Corporation: *See—*
Hilbrink, Johan O., 4,641,135, Cl. 340-784.000.
Mazumder, Ali T.; and Kamel, Mohamed S., 4,641,018, Cl. 235-462.000.
Placke, Dale L.; and Weeks, Donald L., 4,640,505, Cl. 271-209.000.
Seitz, Paul W.; Lewis, Maurice W.; and Lakes, Stephen D., 4,641,159, Cl. 346-200.000.
NEC Corporation: *See—*
Fukuzo, Yukio, 4,641,049, Cl. 307-590.000.
Hasegawa, Satoshi, 4,641,322, Cl. 375-1.000.
Oyamada, Takashi, 4,641,370, Cl. 455-348.000.
Watanabe, Takao; and Watari, Masao, 4,641,342, Cl. 381-41.000.
Yokoyama, Yukio; Kimura, Katsuji; and Goto, Naohisa, 4,641,366, Cl. 455-89.000.
Yotsutani, Akio; Makino, Masayuki; Saegusa, Noboru; and Sone, Tomoshi, 4,640,986, Cl. 379-60.000.
Neefe, Charles W. Method of selectively tinting cast lenses. 4,640,805, Cl. 264-1.100.
Neeley, Walter P., to Mobil Oil Corporation. Method for locating an on-bottom seismic cable. 4,641,287, Cl. 367-19.000.
Neering, Michael J.: *See—*
Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., 4,641,086, Cl. 324-77.00R.
Nelson, Gerald C. Grate for artificial log. 4,640,263, Cl. 126-164.000.
Nelson Industries, Inc.: *See—*
Printiss, Frederick H., Sr.; and Barker, Irvy T., 4,640,536, Cl. 285-367.000.
Neppl, Franz; Schwabe, Ulrich; and Hieber, Konrad, to Siemens Aktiengesellschaft. Method for the manufacture of gate electrodes formed of double layers of metal silicides having a high melting point and doped polycrystalline silicon. 4,640,844, Cl. 427-38.000.
Neri, Armando, to G. D. Societa per Azioni. Conveyor system for transferring a mass of bar shaped articles, in particular cigarettes. 4,641,024, Cl. 250-223.00R.
Nesbitt, Richard L.; and Sievers, Ricky R. Flower saddle for tombstones. 4,640,045, Cl. 47-66.000.
Nestec S.A.: *See—*
Hsu, Sheng-Hsiung, 4,640,839, Cl. 426-285.000.
Svengren, Anders G.; and Ganrot, Bertil A., 4,640,670. Cl. 425-142.000.
Neuder, David L.; and Zellmer, Joel A., to Hewlett-Packard Company. Timing or logic state analyzer with automatic qualified inferential marking and post processing of captured trace data. 4,641,348, Cl. 382-1.000.
Neuroth, Norbert, to Schott Glaswerke. Method for increasing contrast between an object and space when photographing such an object with a television camera. 4,641,187, Cl. 358-106.000.
Neutrogena Corporation: *See—*
Fong, John; Wortzman, Mitchell S.; and Scott, Richard A., 4,640,932, Cl. 514-714.000.
Neville, Donald G., to International Glide Mfg. Corp. Seat swivel apparatus. 4,640,486, Cl. 248-425.000.
New York Blood Center, Inc.: *See—*
Blomback, Birger; and Okada, Masahisa, 4,640,778, Cl. 210-484.000.
New York Institute of Technology: *See—*
Glenn, William E., 4,641,193, Cl. 358-233.000.
Newberry, Claude A. Movable staging scaffold system for building construction. 4,640,383, Cl. 182-38.000.
Newkirk, Gary L.: *See—*
Bryan, Barry L.; Druckerman, Martin; McDowell, Allen W.; Schneider, Ira H.; and Newkirk, Gary L., 4,641,262, Cl. 364-900.000.
Ney, Jean C.: *See—*
Morbioli, Rene J.; and Ney, Jean C., 4,640,768, Cl. 209-37.000.
Neyrpic: *See—*
Megnint, Lucien, 4,641,040, Cl. 290-52.000.
Neywick, Charles V.: *See—*
Lancaster, Gerald M.; Kelley, David C.; Cramm, Russell H.; and Neywick, Charles V., 4,640,865, Cl. 428-421.000.
NGK Insulators, Ltd.: *See—*
Matsuhiro, Keiji; and Matsui, Minoru, 4,640,903, Cl. 501-97.000.
NGK Spark Plug Co., Ltd.: *See—*
Yokoi, Shinichi; and Ito, Tsuneo, 4,640,809, Cl. 264-61.000.
Nguyen, Thoi: *See—*
Dyer, Stanley; Molloy, James J.; Nguyen, Thoi; Riherd, David M.; Voit, William F., Jr.; and West, Donald L., 4,641,148, Cl. 346-76.0PH.
NI Industries, Inc.: *See—*
Cummins, Michael; Cummins, James M.; and Theys, Raymond A., 4,640,142, Cl. 74-501.00R.
Nicklasson, Christer: *See—*
Wing, Anders; and Nicklasson, Christer, 4,640,520, Cl. 280-47.310.
Nielsen, Bent K.: *See—*
Hansen, Otto D.; and Nielsen, Bent K., 4,639,976, Cl. 17-48.000.
Nielson, Otto V.: *See—*
Laursen, Henning; Mosgaard, John; Nielson, Otto V.; and Poland, Clark L., 4,640,810, Cl. 264-518.000.
Nigorikawa, Kazunori: *See—*
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.
Niikura, Yasuhiro: *See—*
Murasugi, Takashi; Suga, Masaaki; and Niikura, Yasuhiro, 4,640,395, Cl. 192-3.310.
Niinomi, Tatsuya; and Kikuchi, Hiroshi, to Hitachi, Ltd. Balancer and controlling method thereof. 4,640,663, Cl. 414-730.000.
Nikkiso Co., Ltd.: *See—*
Arakawa, Kohei, 4,640,830, Cl. 423-346.000.
Yamada, Yasuyuki, 4,640,445, Cl. 222-386.500.
Nikko Kakouzai Co., Ltd.: *See—*
Hattori, Morihisa, 4,640,288, Cl. 128-505.000.
Nimura, Hitoshi: *See—*
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,641,147, Cl. 346-76.0PH.
Ninomiya, Masakazu, to Nippondenso Co., Ltd. Air-fuel ratio control system. 4,640,254, Cl. 123-492.000.
Nippon Ceramic Company, Limited: *See—*
Takahata, Daisuke; and Sakai, Yukiyoshi, 4,641,054, Cl. 310-324.000.
Nippon Chemiphar Company, Ltd.: *See—*
Shimizu, Kimihiro; Nakahara, Tsuguji; Kinoshita, Taketoshi; Takatsuka, Jun; and Igarashi, Michiko, 4,640,835, Cl. 424-94.000.
Nippon Filcon Co., Ltd.: *See—*
Tsuneo, Ishino, 4,640,741, Cl. 162-202.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Tomisawa, Norio, 4,641,326, Cl. 375-108.000.
Nippon Kogaku K.K.: *See—*
Mizunoe, Katsumi; Yanai, Junichi; and Kimoto, Kiyoshi, 4,641,296, Cl. 369-46.000.
Nippon Notion Kogyo Co., Ltd.: *See—*
Fukuroi, Takeo; and Inazawa, Keichi, 4,639,983, Cl. 24-689.000.
Kasai, Kazumi, 4,639,982, Cl. 24-616.000.
Nippon Oil Co., Ltd.: *See—*
Kubo, Junichi, 4,640,765, Cl. 208-110.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Tsubakimoto, Tsuneo; Fujikawa, Iwao; and Kushino, Mitsuo, 4,640,584, Cl. 350-344.000.
Nippon Soken, Inc.: *See—*
Yamamoto, Shinichi; Ito, Toshihiko; and Asano, Mitsuru, 4,640,454, Cl. 228-161.000.
Nippon Steel Corporation: *See—*
Nagai, Takaatsu; Takada, Masayuki; Sato, Akira; and Imamura, Mineo, 4,641,319, Cl. 373-84.000.
Ohno, Jiro; and Yashiro, Hirokatsu, 4,641,036, Cl. 250-574.000.
Ohno, Jiro; and Yashiro, Hirokatsu, 4,641,083, Cl. 324-58.50B.
Nippon Telegraph and Telephone Corporation: *See—*
Tanaka, Jouji; Watanabe, Tetunobu; Tanimoto, Yoshiji; and Okumura, Minoru, 4,641,337, Cl. 379-162.000.
Nippondenso Co., Ltd.: *See—*
Kamai, Kenichiro, 4,640,253, Cl. 123-475.000.
Kato, Hidetoshi; Maehara, Fuyuky; and Mayumi, Nobuo, 4,641,079, Cl. 320-64.000.
Kodama, Katsuhiko; and Yamazoe, Hisamitsu, 4,640,257, Cl. 123-571.000.
Nagata, Masami; Yanase, Sumio; and Setaka, Yousuke, 4,641,066, Cl. 318-254.000.
Ninomiya, Masakazu, 4,640,254, Cl. 123-492.000.
Nomura, Yoshihisa; Oka, Hiroyuki; and Otsuki, Hiromi, 4,640,558, Cl. 303-119.000.
Taki, Yoshihiro; Akado, Hajime; Funae, Keizo; and Inukai, Satoshi, 4,640,779, Cl. 210-493.500.
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, 4,640,996, Cl. 200-19.00R.
Nishibe, Takashi: *See—*
Yokoyama, Shotaro; and Nishibe, Takashi, 4,640,613, Cl. 356-1.000.
Nishida, Yuji; Kamiyama, Yoshiyasu; and Okuno, Koichi, to Nitto Electric Industrial Co., Ltd. Membrane separation apparatus. 4,640,773, Cl. 210-321.100.
Nishikawa, Hiromitu: *See—*
Yamagishi, Jun; and Nishikawa, Hiromitu, 4,640,050, Cl. 49-280.000.
Nishikawa, Kohei: *See—*
Meguro, Kanji; and Nishikawa, Kohei, 4,640,916, Cl. 514-222.000.
Nishikawa, Masahiko, to Pegasus Sewing Machine Mfg. Co., Ltd. Hemming apparatus. 4,640,206, Cl. 112-143.000.
Nishimoto, Naomichi: *See—*
Ichinoi, Yutaka; and Nishimoto, Naomichi, 4,641,201, Cl. 358-310.000.
Nishimura, Jinichi. Rotating heat exchanger. 4,640,345, Cl. 165-92.000.
Nishimura, Kotaro: *See—*
Sasaki, Yukio; Nishimura, Kotaro; and Minato, Osamu, 4,641,285, Cl. 365-210.000.
Nishimura, Sadanori; and Sekine, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Control device for vehicular transmission. 4,640,393, Cl. 192-0.052.
Nishimura, Sadanori, to Honda Giken Kogyo Kabushiki Kaisha. Device for controlling the operation of clutch for fluid torque converter. 4,640,396, Cl. 192-331.000.
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, to Canon Kabushiki Kaisha. Opti-

cal display utilizing thermally formed bubble in a liquid core waveguide. 4,640,592, Cl. 350-96.320.

Nishimuro, Tadashi: *See*—
Itoh, Yoshio; Ohtsuka, Hiroshi; Nishimuro, Tadashi; and Moriyama, Norio, 4,640,888, Cl. 430-323.000.

Nishino, Kenichi; Kobayashi, Atsuo; Higashi, Sachio; Yamamoto, Shinichiro; and Yasuda, Kiyoshi, to Takeda Chemical Industries, Ltd. Thixotropic polyurethane resin compositions. 4,640,950, Cl. 524-265.000.

Nishio, Yoshihiro: *See*—
Nakamura, Chiaki; Oe, Koji; Muta, Tomonobu; Sasaki, Toshiki; and Nishio, Yoshihiro, 4,640,887, Cl. 430-275.000.

Nishizawa, Jun-chi, to Semiconductor Research Foundation. Semiconductor optoelectro transducer. 4,641,167, Cl. 357-30.000.

Nishizawa, Nobuyoshi: *See*—
Tajima, Osamu; Yamada, Makoto; Hagino, Hideo; and Nishizawa, Nobuyoshi, 4,640,873, Cl. 429-24.000.

Nissan Motor Company, Limited: *See*—
Abo, Toshimi; and Hata, Yoshitaka, 4,640,243, Cl. 123-399.000.
Doi, Koichi, 4,640,183, Cl. 98-2.010.
Hosaka, Akio; and Yamamoto, Akito, 4,640,250, Cl. 123-425.000.
Kasai, Junichi; and Imai, Hiroshi, 4,641,344, Cl. 381-57.000.
Kawamura, Yoshihisa; and Fukuzumi, Shuzo, 4,640,249, Cl. 123-425.000.
Murasugi, Takashi; Suga, Masaaki; and Niikura, Yasuhiro, 4,640,395, Cl. 192-3.310.
Shibahata, Yasuji; Tsubota, Yasumasa; and Uno, Takaaki, 4,640,379, Cl. 180-140.000.
Wakai, Shinzi, 4,640,316, Cl. 139-1.00R.

Nissenson, Bilha: *See*—
Fenster, Paul; Shimoni, Yair; Nissenson, Bilha; and Alperin, Noam, 4,641,352, Cl. 382-6.000.

Nitsch, Manfred: *See*—
Modic, Fedor; Leibfried, Wolfgang; Nitsch, Manfred; Spitzenberger, Kurt; and Zimmermann, Herbert, 4,640,739, Cl. 156-659.100.

Nitsuko Limited: *See*—
Tanaka, Jouji; Watanabe, Tetunobu; Tanimoto, Yoshiji; and Okumura, Minoru, 4,641,337, Cl. 379-162.000.

Nitta, Yoshihiko; Okajima, Atsushi; and Yamano, Fumiyuki, to Hitachi, Ltd. Method for automatic translation between natural languages. 4,641,264, Cl. 364-900.000.

Nitta, Yoshio: *See*—
Hongo, Yusuo; and Nitta, Yoshio, 4,641,355, Cl. 382-34.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Nishida, Yuji; Kamiyama, Yoshiyasu; and Okuno, Koichi, 4,640,773, Cl. 210-321.100.

NL Industries, Inc.: *See*—
Barr, John D.; and Fuller, John M., 4,640,375, Cl. 175-410.000.

Nobel, Fred I.; and Schram, David N., to LeaRonal, Inc. Bath and process for plating tin/lead alloys on composite substrates. 4,640,746, Cl. 204-15.000.

Noda, Kazushi; Komatsu, Moriyuki; and Mitsunaga, Hiroshi, to Toyoda Gosei Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Heated or cooled steering wheel. 4,640,340, Cl. 165-41.000.

Noda, Yasushi: *See*—
Kashiwagi, Yoshiyuki; Noda, Yasushi; and Kitakizaki, Kaoru, 4,640,999, Cl. 200-144.00B.

Noguchi, Koji: *See*—
Kawanishi, Tsuneaki; Mori, Yasuki; Noguchi, Koji; and Iimura, Tsutomu, 4,640,880, Cl. 430-106.600.

Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, to Koa Oil Company, Limited. Apparatus for producing bulk mesophase. 4,640,822, Cl. 422-111.000.

Noguchi, Yukio: *See*—
Sasaki, Tomio; and Noguchi, Yukio, 4,641,272, Cl. 364-559.000.

Nohmi, Makoto: *See*—
Yabushita, Masaharu; Nohmi, Makoto; Fujikura, Nobuyuki; Miyamoto, Shoji; and Ihara, Hirokazu, 4,641,237, Cl. 364-200.000.

Nojiri, Hidetoshi, to Canon Kabushiki Kaisha. Semiconductor thin film lens. 4,640,585, Cl. 350-413.000.

Nold, Peter: *See*—
Geller, Heinrich; Nold, Peter; Schermer, Heinz; and Rave, Ortwin, 4,640,447, Cl. 222-603.000.

Noma, Takashi: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.

Nomura, Yoshihisa; Oka, Hiroyuki; and Otsuki, Hiromi, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Anti-skid brake system. 4,640,558, Cl. 303-119.000.

Noptel Ky: *See*—
Myllyla , Risto; Kopola, Harri; Kostamovaara, Juha; and Ahola, Raimo, 4,640,514, Cl. 273-310.000.

Norcia, John A.; Bickar, Ray; and Wheatley, William M., to Ram Automotive Company. Portable system for filling bottles with nitrous oxide. 4,640,323, Cl. 141-18.000.

Nordson Corporation: *See*—
Hartle, Ronald J.; and Hall, Robert C., 4,640,310, Cl. 137-883.000.

North American Philips Corporation: *See*—
't Hoen, Pieter, 4,640,291, Cl. 128-660.000.

Northrop Corporation: *See*—
Poland, David A., 4,640,501, Cl. 269-21.000.

Northrup, Allan R.; and Tomkinson, John G., to Amaray International Corporation. Disk storage and carrying case. 4,640,416, Cl. 206-425.000.

Northwestern Steel and Wire Company: *See*—
Mullen, Michael J., 4,641,320, Cl. 373-96.000.

Norton Christensen, Inc.: *See*—
Jurgens, Rainer, 4,641,289, Cl. 367-85.000.

Nouveaux Security Products Limited: *See*—
Zebedee, Alan R.; and Hutchins, Derek R., 4,640,052, Cl. 49-383.000.

Nunamaker, Charles S.: *See*—
Fromson, Robert E.; Kossowsky, Ram; and Nunamaker, Charles S., 4,640,169, Cl. 83-685.000.

Nuncio, Theodore. Contaminant sealing system and method. 4,640,075, Cl. 52-484.000.

N.V. Optimed: *See*—
Henkel, Gunter, 4,640,587, Cl. 350-432.000.

N.V. Raychem S.A.: *See*—
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,641,009, Cl. 219-200.000.

N.V. W.A. Hoek's Machine: *See*—
Hoek, Cornelis; and van Ditten, Jurjen L., 4,640,031, Cl. 40-306.000.

Obenshain, D. Noel. Door closer mechanism. 4,639,969, Cl. 16-70.000.

Obey, James H.: *See*—
Moore, James G.; Obey, James H.; and Pinkel, Edward B., 4,640,740, Cl. 159-13.100.

Oblad, Roger P.: *See*—
Barr, John T., IV; Neering, Michael J.; Fullmer, Douglas E.; Oblad, Roger P.; Cannon, Wayne C.; and Elmore, Glenn E., 4,641,086, Cl. 324-77.00R.

O'Brien, Jay P.: *See*—
Mohacsi, Erno; and O'Brien, Jay P., 4,640,930, Cl. 514-431.000.

O'Brien, Michael J.: *See*—
Tracy, David H.; O'Brien, Michael J.; and Bohler, Walter, 4,640,627, Cl. 374-121.000.

Occidental Chemical Corp.: *See*—
Warzawski, Bernard; and Fauvel, Pierre, 4,640,876, Cl. 429-37.000.

Oce-Nederland B.V.: *See*—
Holtman, Lodewijk T., 4,640,409, Cl. 198-624.000.
Simons, Petrus A. M. R.; and Bouts, Wilhelmus J., 4,640,879, Cl. 430-96.000.

Ochi, Shuhei: *See*—
Abura, Yoshinori; Tsuji, Eiji; Okuyama, Kenji; and Ochi, Shuhei, 4,641,010, Cl. 219-222.000.

Ochiai, Yoshitaka: *See*—
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.

O'Connor, John J.: *See*—
Garritano, Ronald F.; O'Connor, John J.; and Papayanopulos, Manuel E., 4,640,120, Cl. 73-12.000.

Oe, Koji: *See*—
Nakamura, Chiaki; Oe, Koji; Muta, Tomonobu; Sasaki, Toshiki; and Nishio, Yoshihiro, 4,640,887, Cl. 430-275.000.

Oe, Tsutomu; Kimura, Shigeaki; Yuzaki, Yoshinori; and Ozaki, Tadao, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for fabricating multi-layer spiral tubes. 4,640,453, Cl. 228-17.700.

Ogasa, Takehiro: *See*—
Mochida, Kenichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, 4,640,919, Cl. 514-241.000.

Ogawa, Masashi: *See*—
Hashiue, Masakazu; and Ogawa, Masashi, 4,640,759, Cl. 204-299.00R.

Ogawa, Tetsuya; Kitano, Kisei; Goto, Yasuyuki; Fukui, Masahiro; and Sugimori, Shigeru, to Chisso Corporation. 5-alkyl-2-(3,4-difluorophenyl)pyrimidine and nematic liquid crystal composition containing same. 4,640,795, Cl. 252-299.500.

Ogawa, Tetsuya: *See*—
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.

Ogawa, Toshiyuki: *See*—
Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, 4,640,608, Cl. 355-15.000.

Oguchi, Kikuo; and Uchikawa, Yoshiro, to Kabushiki Kaisha Seiko Epson. System for driving a liquid crystal matrix display so as to avoid crosstalk. 4,640,582, Cl. 350-333.000.

Ogura, Masaaki: *See*—
Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, 4,640,608, Cl. 355-15.000.

Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Shepard, Joseph F., to International Business Machines Corporation. Self-aligned lateral bipolar transistors. 4,641,170, Cl. 357-35.000.

Ohashi, Saichiro: *See*—
Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, 4,640,597, Cl. 353-79.000.

Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, to Ricoh Company, Ltd. Copying method for bookbinding. 4,640,611, Cl. 355-77.000.

Ohgoda, Makoto; and Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Device for feeding and positioning recording medium. 4,640,507, Cl. 271-245.000.

Ohi Seisakusho Co., Ltd.: *See*—
Yamagishi, Jun; and Nishikawa, Hiromitu, 4,640,050, Cl. 49-280.000.

Ohishi, Hirotoshi: *See*—
Fujihisa, Hiroaki; Fujii, Hiroshi; Ohishi, Hirotoshi; and Kobayashi, Yoshiaki, 4,641,001, Cl. 200-153.00G.

Ohishi, Toshio; and Kurotobi, Yohji, to Honda Giken Kogyo Kabushiki Kaisha. Air cleaner device. 4,640,698, Cl. 55-502.000.

Ohler, Steven W., to Brunswick Corporation. Magnetically actuated line feathering system for spin cast reels. 4,640,470, Cl. 242-84.20A.

Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, to Hoya Corporation. Process for producing glass product having gradient of refractive index. 4,640,699, Cl. 65-3.150.

Ohno, Jiro; and Yashiro, Hirokatsu, to Nippon Steel Corporation. Method of and apparatus for imaging surface of object at high temperature. 4,641,036, Cl. 250-574.000.

Ohno, Jiro; and Yashiro, Hirokatsu, to Nippon Steel Corporation. Method and apparatus for supervising charges in blast furnace using electromagnetic waves. 4,641,083, Cl. 324-58.50B.

Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, to Casio Computer Co., Ltd.; and Casio Electronics Manufacturing Co., Ltd. Recording apparatus with double freqüency driven liquid crystal shutter. 4,641,156, Cl. 346-160.000.

Ohta, Takahiro; Inuiya, Masafumi; and Fujimura, Ikuo, to Fuji Photo Film Co., Ltd. Method of and apparatus for recording video signal associated with photographic image. 4,641,198, Cl. 358-285.000.

Ohtsuka, Hiroshi: *See*—
Itoh, Yoshio; Ohtsuka, Hiroshi; Nishimuro, Tadashi; and Moriyama, Norio, 4,640,888, Cl. 430-323.000.

Ohuchi, Muneki: *See*—
Kamo, Osamu; Ohuchi, Muneki; and Matsushita, Kazuhiro, 4,641,096, Cl. 324-311.000.

Ohyama, Masao, to Sony Corporation. Magnetic recording and reproducing apparatus. 4,641,210, Cl. 360-96.500.

Oikawa, Tomohiro: *See*—
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.

Oishi, Makoto: *See*—
Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, 4,641,215, Cl. 360-35.100.

Oka, Hiroyuki: *See*—
Nomura, Yoshihisa; Oka, Hiroyuki; and Otsuki, Hiromi, 4,640,558, Cl. 303-119.000.

Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Method of forming composite or dichromatic images. 4,640,883, Cl. 430-122.000.

Okachi, Ryo: *See*—
Mochida, Kenichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, 4,640,919, Cl. 514-241.000.

Okada, Masahisa: *See*—
Blomback, Birger; and Okada, Masahisa, 4,640,778, Cl. 210-484.000.

Okada, Yoshio; and Igarashi, Yuriko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Partially pressure-sensitive recording paper. 4,640,847, Cl. 427-150.000.

Okado, Kenji: *See*—
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,640,882, Cl. 430-110.000.

Okajima, Atsushi: *See*—
Nitta, Yoshihiko; Okajima, Atsushi; and Yamano, Fumiyuki, 4,641,264, Cl. 364-900.000.

Okajima, Takahiro: *See*—
Ikedo, Yuji; and Okajima, Takahiro, 4,641,298, Cl. 369-77.100.

Okamoto, Toshiyuki: *See*—
Nakanowatari, Jun; Machida, Mitsuo; Okamoto, Toshiyuki; and Nakura, Yoshihiro, 4,640,581, Cl. 350-331.00R.

Okamura, Shigeru; and Taguchi, Takao, to Fujitsu Limited. Ion implantation apparatus and method for maskless processing. 4,641,034, Cl. 250-492.200.

Okano, Takeshi; Nakaoka, Sadaaki; and Ohashi, Saichiro, to Fuji Photo Film Co., Ltd. Micro-reader. 4,640,597, Cl. 353-79.000.

Okaya, Takuji: *See*—
Akazawa, Toshiyuki; Tanaka, Yoshinari; and Okaya, Takuji, 4,640,870, Cl. 428-483.000.

O'Keefe, Michael; and Fox, John R., to S.R. Gent plc. Detachable guide for a sewing machine operating station. 4,640,207, Cl. 112-236.000.

Okegawa, Tadao: *See*—
Imaki, Katsuhiro; Okegawa, Tadao; and Arai, Yoshinobu, 4,640,931, Cl. 514-510.000.

OKI Electric Industry Co., Ltd.: *See*—
Hiroshi, Yokouchi, 4,641,109, Cl. 331-116.0FE.
Itoh, Yoshio; Ohtsuka, Hiroshi; Nishimuro, Tadashi; and Moriyama, Norio, 4,640,888, Cl. 430-323.000.

Okibayashi, Katsushi; Itoh, Masataka; and Katoh, Shohichi, to Sharp Kabushiki Kaisha. Two-dimensional image read-out device. 4,641,359, Cl. 382-68.000.

Okimoto, Tomoyuki: *See*—
Kondo, Mitsuru; Okimoto, Tomoyuki; and Kanda, Nobuo, 4,641,160, Cl. 346-220.000.

Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, to Alps Electric Co., Ltd. Disk cartridge loading mechanism in a recording and reproducing apparatus. 4,641,211, Cl. 360-97.000.

Okumoto, Yutaka, to Japan Tobacco Inc. Apparatus for cutting cigarettes. 4,640,168, Cl. 83-677.000.

Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, to Yamauchi Rubber Industry Co., Ltd. Method for making magnetic rolls. 4,640,808, Cl. 264-46.500.

Okumura, Minoru: *See*—
Tanaka, Jouji; Watanabe, Tetunobu; Tanimoto, Yoshiji; and Okumura, Minoru, 4,641,337, Cl. 379-162.000.

Okumura, Yoshihiro: *See*—
Mori, Masaaki; Sano, Akira; Horiuchi, Yushi; and Okumura, Yoshihiro, 4,640,023, Cl. 34-57.00A.

Okuno, Koichi: *See*—
Nishida, Yuji; Kamiyama, Yoshiyasu; and Okuno, Koichi, 4,640,773, Cl. 210-321.100.

Okuyama, Kenji: *See*—
Abura, Yoshinori; Tsuji, Eiji; Okuyama, Kenji; and Ochi, Shuhei, 4,641,010, Cl. 219-222.000.

Olson, David L.: *See*—
Kittle, Carl E.; LaFave, Arthur J.; and Olson, David L., 4,640,368, Cl. 172-430.000.

Olson, Harold D., to Cagle's Inc. Thigh deboner. 4,639,974, Cl. 17-46.000.

Olson, Lawrence N.: *See*—
Murray, Leroy J.; Olson, Lawrence N.; Chavoya, Robert; and Wade, James, 4,640,735, Cl. 156-584.000.

Olson, Raymond N.: *See*—
Glennon, Timothy F.; Olson, Raymond N.; and Straznickas, Donald A., 4,641,080, Cl. 322-49.000.

Olsson, Bertil: *See*—
Olsson, John; Olsson, Bertil; and Olsson, Gunnar, 4,640,234, Cl. 123-557.000.

Olsson, Gunnar: *See*—
Olsson, John; Olsson, Bertil; and Olsson, Gunnar, 4,640,234, Cl. 123-557.000.

Olsson, John; Olsson, Bertil; and Olsson, Gunnar, to J-Jet Konstruktion HB. Method of running an internal combustion engine with alternative fuels. 4,640,234, Cl. 123-557.000.

Olympus Optical Co., Ltd.: *See*—
Iba, Yoichi; Kimura, Tadashi; and Kajitani, Kazuo, 4,640,586, Cl. 350-414.000.
Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, 4,641,215, Cl. 360-35.100.
Komatsu, Satsuki, 4,641,084, Cl. 324-71.500.

Omnimax Energy Corporation: *See*—
Shakun, Wallace, 4,640,977, Cl. 136-211.000.

Onasch, Jurgen: *See*—
Fischer, Artur; Onasch, Jurgen; and Haage, Manfred, 4,640,654, Cl. 411-55.000.

Ondeck, Elmer J.: *See*—
McMahon, Raymond D.; Jellovitz, John C.; Vaile, James T.; Renn, Gregory J.; and Ondeck, Elmer J., 4,640,165, Cl. 83-346.000.

O'Neill, John C. Apparatus for retaining fishing rods in a boat. 4,640,039, Cl. 43-21.200.

Oniki, Toru: *See*—
Takiguchi, Eiji; Yuto, Kazuaki; and Oniki, Toru, 4,640,952, Cl. 524-296.000.

Ono Pharmaceutical Co., Ltd.: *See*—
Imaki, Katsuhiro; Okegawa, Tadao; and Arai, Yoshinobu, 4,640,931, Cl. 514-510.000.

Ono, Takahiro; Akutsu, Takao; and Fujiwara, Hideyuki, to Japan Tobacco Inc. Drying and conditioning apparatus for tobacco. 4,640,299, Cl. 131-303.000.

Ono, Takeshi, to Canon Kabushiki Kaisha. Communication apparatus which alerts operator to preset automatic operation. 4,641,133, Cl. 340-540.000.

Onodera, Kaoru: *See*—
Komorita, Kazuo; Miyoshi, Masanobu; and Onodera, Kaoru, 4,640,889, Cl. 430-505.000.

Onoyama, Toshiaki: *See*—
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki, 4,641,065, Cl. 318-135.000.

Opitz, Charles L.; and Chase, Paul E., to Lockheed Electronics Co., Inc. Radar apparatus for determining range to an agitated reflective target. 4,641,137, Cl. 342-52.000.

Opitz, Charles L., to Lockheed Electronics Co., Inc. Radar apparatus for detecting an agitated reflective target. 4,641,133, Cl. 342-61.000.

Opti-Copy, Inc.: *See*—
Wilson, Monti R.; Hutchison, Victor E.; Bendure, William J.; and Anderson, Frederick W., 4,641,244, Cl. 364-475.000.

Ordo, Richard A., to General Motors Corporation. Assembly method and apparatus for spline-type connection. 4,640,294, Cl. 192-70.2.

Osabe, Akira: *See*—
Yokota, Yuji; and Osabe, Akira, 4,641,212, Cl. 360-99.000.

Osada, Naomi: *See*—
Kato, Shigeru; Osada, Naomi; Ichitoh, Toshikatsu; Murata, Masae; and Mochizuki, Masfumi, 4,641,151, Cl. 346-76.0PH.

Osada, Shinichi: *See*—
Makino, Takao; and Osada, Shinichi, 4,641,331, Cl. 378-108.000.

Osaka Gas Company Limited: *See*—
Mori, Makihiko; Kibe, Satoshi; and Maeda, Toyohiro, 4,640,761, Cl. 208-44.000.

Osborn, Merritt A. Epicyclic power transmission. 4,640,154, Cl. 74-805.000.

Osborn, Merritt A.: *See*—
Anderson, J. Edward C.; and Osborn, Merritt A., 4,640,117, Cl. 72-410.000.

Oscar Mayer Foods Corporation: *See*—
Anderson, James E.; and Holmes, Terry L., 4,640,219, Cl. 118-24.000.

Oshima, Noritsugu: *See*—
Takeda, Hiroshi; Oshima, Noritsugu; Kubo, Tateo; and Sakaguchi, Kenichi, 4,640,673, Cl. 425-297.000.

Ossian, William F., to American Can Company. Multiple layer films containing oriented layers of nylon and ethylene vinyl alcohol copolymer. 4,640,852, Cl. 428-35.000.

Ostrozynski, Robert L.; Greene, George H.; and Merrifield, James H., to Union Carbide Corporation. Silicone-modified polyester resin and silicone-sheathed polyester fibers made therefrom. 4,640,962, Cl. 525-474.000.

Oswald, Thomas: *See*—
Kelly, Patrick S.; Oswald, Thomas; Jeal, Alan J.; Hill, Stephen E.; and Murphy, Robert, 4,641,372, Cl. 455-601.000.

Othmer, Ekkehard; and Othmer, Sieglinde C., to Bristol-Myers. Treatment of sexual dysfunction with buspirone. 4,640,921, Cl. 514-252.000.

Othmer, Sieglinde C.: *See*—
Othmer, Ekkehard; and Othmer, Sieglinde C., 4,640,921, Cl. 514-252.000.

Otis Engineering Corporation: *See*—
Taylor, Frank H., 4,640,363, Cl. 166-317.000.

Otsuki, Hiromi: *See*—
Nomura, Yoshihisa; Oka, Hiroyuki; and Otsuki, Hiromi, 4,640,558, Cl. 303-119.000.

Ott, Russell G.: *See*—
Dwyer, Robert A.; and Ott, Russell G., 4,641,261, Cl. 364-900.000.

Otto, Johann: *See*—
Schmid, Ralf; Otto, Johann; Bernklau, Daniela; and Knapek, Erwin, 4,640,626, Cl. 374-57.000.

Ounuma, Shouji, to Tokyo Shbaura Denki Kabushiki Kaisha. Memory system. 4,641,282, Cl. 365-189.000.

Overbergh, Noel: *See*—
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,641,009, Cl. 219-200.000.

Owen, Richard K.: *See*—
Wood, Marcus B.; and Owen, Richard K., 4,640,030, Cl. 40-158.00R.

Owens-Corning Fiberglas Corporation: *See*—
Gill, Gurdev S., 4,640,082, Cl. 53-523.000.
Harris, Ronald R.; and Ault, Russell L., 4,640,065, Cl. 52-204.000.

Owens-Illinois, Inc.: *See*—
Chang, Long Fei, 4,640,428, Cl. 215-270.000.
St. Clair, David L., 4,640,855, Cl. 428-36.000.

Oximetrix, Inc.: *See*—
Beard, Robert W., 4,640,279, Cl. 128-303.140.

Oy Partek AB: *See*—
Paakkinen, Ilmari, 4,640,074, Cl. 52-410.000.

Oyama, Masumi, to Kabushiki Kaisha Toshiba. Information medium. 4,641,374, Cl. 455-603.000.

Oyama, Takuji; and Mizuhashi, Mamoru, to Asahi Glass Company, Ltd. Optical article having improved heat resistance. 4,640,867, Cl. 428-432.000.

Oyamada, Takashi, to NEC Corporation. Housing assembly for portable radio apparatus with one-piece baseplate and battery container. 4,641,370, Cl. 455-348.000.

Ozaki, Hideyuki: *See*—
Shimotori, Kazuhiro; Fujishima, Kazuyasu; Ozaki, Hideyuki; and Miyatake, Hideshi, 4,641,286, Cl. 365-230.000.

Ozaki, Tadao: *See*—
Oe, Tsutomu; Kimura, Shigeaki; Yuzaki, Yoshinori; and Ozaki, Tadao, 4,640,453, Cl. 228-17.700.

Ozawa, Juichiro, to Susumu Industrial Co., Ltd.; and Thin Film Technology Corporation. Delay line device having symmetrical delay path. 4,641,113, Cl. 333-161.000.

Ozawa, Kunitaka: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.

Ozawa, Motoo, to Honda Giken Kogyo K.K. Radiator for vehicles, having improved mountability into vehicles. 4,640,341, Cl. 165-41.000.

Ozawa, Toshiaki; Yamada, Yasuaki; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Printer with improved carriage and character wheel driving means. 4,640,634, Cl. 400-144.200.

Ozo-Tek, Inc.: *See*—
Burleson, James C., 4,640,782, Cl. 210-748.000.

Ozu, Tadahiro: *See*—
Nakano, Hideaki; and Ozu, Tadahiro, 4,640,236, Cl. 123-41.790.

P.T.E. Inc.: *See*—
Ludwig, Frank, 4,640,119, Cl. 73-12.000.

Paakkinen, Ilmari, to Oy Partek AB. Concrete building unit of a sandwich structure and a truss element and an insulating plate for such a building unit. 4,640,074, Cl. 52-410.000.

Pace, James W., to Boeing Company, The. Closing device for an airfoil. 4,640,477, Cl. 244-214.000.

Page, Ronald D., to Mobil Oil Corporation. Method and apparatus for splitting ice masses. 4,640,552, Cl. 299-24.000.

Palazzo, David T. Double wall storage tank for liquids and method of making same. 4,640,439, Cl. 220-445.000.

Paley, Gary, to Trine Products Corporation. Template for installation of electric door strikes. 4,640,019, Cl. 33-563.000.

Palmaer, Karl V.; and Park, David B. Conveying system of the type in which plastic carriers are mounted on plastic links of a conveyor chain. 4,640,410, Cl. 198-803.010.

Palmaer, Leif. Method of and means for holding a securing member in an existing attachment slit. 4,639,950, Cl. 2-422.000.

Palmer, Darrel R.: *See*—
Ford, George W., Jr.; and Palmer, Darrel R., 4,640,440, Cl. 222-190.000.

Panizza, Ettore; and Premoli, Ercole, to Fiat Auto S.p.A. Anti-skid device for motor vehicles. 4,640,557, Cl. 303-100.000.

Paoletti, Antonio: *See*—
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.

Papanicolaou, Nicolas A., to United States of America, Navy. Method of making planar geometry Schottky diode using oblique evaporation and normal incidence proton bombardment. 4,640,003, Cl. 29-576.00B.

Papayanopulos, Manuel E.: *See*—
Garritano, Ronald F.; O'Connor, John J.; and Papayanopulos, Manuel E., 4,640,120, Cl. 73-12.000.

Park, Chung P., to Dow Chemical Company, The. Expandable polyolefin compositions and preparation process utilizing isobutane blowing agent. 4,640,933, Cl. 521-94.000.

Park, David B.: *See*—
Palmaer, Karl V.; and Park, David B., 4,640,410, Cl. 198-803.010.

Park, Joonsup; and Falcetta, Joseph J., to Alcon Laboratories. Hydrogels containing siloxane comonomers. 4,640,941, Cl. 523-107.000.

Park, Joonsup: *See*—
Falcetta, Joseph J.; and Park, Joonsup, 4,640,965, Cl. 526-242.000.

Parker Hannifin Corporation: *See*—
Hoffman, Robert K.; Kavanaugh, Mark A.; and Franson, David C., 4,640,309, Cl. 137-596.180.

Parker, Kenneth B.: *See*—
Blair, Christon R.; and Parker, Kenneth B., 4,640,647, Cl. 405-224.000.

Parks, Hal. Impeller and compaction refuse collection system. 4,640,659, Cl. 414-503.000.

Paroli, Paolo: *See*—
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.

Parsons, David M. Device for moving an automobile with disabled wheels. 4,640,495, Cl. 254-8.00B.

Pascaloff, John H., to Hall Surgical-Divison of Zimmer, Inc. Method and apparatus for providing sterile charged batteries. 4,641,077, Cl. 320-2.000.

Patell, Farrokh A.; and McConkey, Stephen E., to Shaw Industries Ltd. Prefabricated thermally insulated pipeline section. 4,640,312, Cl. 138-109.000.

Patrick, William J.: *See*—
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,640,221, Cl. 118-689.000.

Patterson, Joseph M.: *See*—
Ramsden, Hugh E.; and Patterson, Joseph M., 4,640,909, Cl. 502-407.000.

Patterson, Robert W.: *See*—
Simpson, Wayne F.; Ayers, Ray R.; and Patterson, Robert W., 4,640,645, Cl. 405-63.000.

Pavlov, Ivan K., to Essex Group, Inc. High speed wire cutter. 4,640,164, Cl. 83-304.000.

Pazarci, Melih: *See*—
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,641,179, Cl. 358-12.000.

Pearce, Thomas M.: *See*—
Files, William C.; Pellerin, Norvin L.; Rodboon, Somsak S.; and Pearce, Thomas M., 4,640,024, Cl. 34-133.000.

Pearman, Bruce W.; and Huggins, Hal A., to Huggins, Hal A. Ammeter apparatus and method for capturing current readings. 4,641,089, Cl. 324-103.00P.

Pegasus Sewing Machine Mfg. Co., Ltd.: *See*—
Nishikawa, Masahiko, 4,640,206, Cl. 112-143.000.

Peiffer, Dennis G.; Kowalik, Ralph M.; and Lundberg, Robert D., to Exxon Research and Engineering Company. Drag reduction with novel hydrocarbon soluble polyampholytes. 4,640,945, Cl. 523-336.000.

Peletan, Rene , to Framatome. Apparatus with linear movement. 4,640,811, Cl. 376-228.000.

Pellerin Milnor Corporation: *See*—
Files, William C.; Pellerin, Norvin L.; Rodboon, Somsak S.; and Pearce, Thomas M., 4,640,024, Cl. 34-133.000.

Pellerin, Norvin L.: *See*—
Files, William C.; Pellerin, Norvin L.; Rodboon, Somsak S.; and Pearce, Thomas M., 4,640,024, Cl. 34-133.000.

Penick, Joe E.: *See*—
Green, Gary J.; McVeigh, Harry A.; Penick, Joe E.; and Yan, Tsoung Y., 4,640,675, Cl. 431-2.000.

Penn, Howard I., to Morton Thiokol Inc. Clear, weather resistant adherent coating. 4,640,868, Cl. 428-446.000.

Pennewiss, Horst: *See*—
Schnee, Reiner; Pennewiss, Horst; and Markert, Gerhard, 4,640,954, Cl. 524-516.000.

Penney, C. Bradford; and Sharrah, Raymond L., to Streamlight, Inc. Archery shooting bow with stabilizing flashlight. 4,640,258, Cl. 124-24.00R.

Peresie, David N.: *See*—
Streets, Roger L.; Rabito, Thomas G.; and Peresie, David N., 4,640,730, Cl. 156-334.000.

Perez, Manuel. Adjustable flexible dual gas mixing assembly. 4,640,260, Cl. 126-39.00E.

Perkin-Elmer Corporation, The: *See*—
Schlesinger, Eugene R., 4,640,580, Cl. 350-274.000.
Tracy, David H.; O'Brien, Michael J.; and Bohler, Walter, 4,640,627, Cl. 374-121.000.

Perlman, Eugene H.; and MacNaughton, Laurence, III, to Digital Associates Corporation. Controller system or emulating local parallel minicomputer/printer interface and transferring serial data to remote line printer. 4,641,263, Cl. 364-900.000.

Perri, Joseph: *See*—
LaBate, Micheal D.; and Perri, Joseph, 4,640,498, Cl. 266-272.000.

Perrin, Denis. Flame shield for cigarette lighter and cigarette lighter including said flame shield. 4,640,679, Cl. 431-146.000.

Perry, Nigel D.: *See*—
Tobin, Roderick C.; and Perry, Nigel D., 4,641,313, Cl. 372-56.000.

Persinski, Leonard J.; Walker, Jerry L.; and Boffardi, Bennett P., to Calgon Corporation. Synergistic scale and corrosion inhibiting admixtures containing carboxylic acid/sulfonic acid polymers. 4,640,793, Cl. 252-82.000.

Person, Herman R., to Dale Electrons, Inc. Thick film delay line comprising a plurality of stacked delay assemblies formed by a printing process. 4,641,114, Cl. 333-161.000.

Pesa, Nastazio. Meter beater timer. 4,641,125, Cl. 340-309.150.

Petelin, Andrei N.; Sharp, Celia M.; Ury, Michael G.; and Wooden, Gene R., to Fusion Systems Corporation. Apparatus and method preventing radiation induced degradation of optical elements. 4,641,033, Cl. 250-492.100.

Peterson, Drew, to Hall Surgical, Division of Zimmer, Inc. Tubing organizer. 4,639,980, Cl. 24-306.000.

Petrocco, Giovaani: *See*—
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.

Petroleum Fermentations N.V.: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, 4,640,719, Cl. 134-40.000.

Peyrelongue, Jean-Pierre: *See*—
Semedard, Jean-Claude; Marsault. Jean-Jacques; Peyrelongue, Jean-Pierre; and Vallee, Gerard, 4,640,480, Cl. 248-62.000.

Pfizenmaier, Wolfgang; Heidt, Heinrich; and Lehner, Rolf P., to Heidelberger Druckmaschinen AG. Device for determining and adjusting the position of a web. 4,641,070, Cl. 318-640.000.

Philapitsch, Anton: *See*—
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.

Phillips, Charles A.: *See*—
Fullerton, Larry W., 4,641,317, Cl. 375-1.000.

Phillips, James E.; and Lasswell, Patrick G., to University of Delaware, The. Method and apparatus for increasing the durability and yield of thin film photovoltaic devices. 4,640,002, Cl. 29-574.000.

Phillips Petroleum Company: *See*—
Billings, William G., 4,640,760, Cl. 208-390.000.
Borenstein, David E., 4,639,986, Cl. 28-272.000.
Bresson, Clarence R.; and Louthan, Rector P., 4,640,789, Cl. 252-61.000.
Johnson, Marvin M.; and McDaniel, Max P., 4,640,964, Cl. 526-134.000.
Schuettenberg, Alexander D., 4,640,787, Cl. 252-51.50A.

Piazza, Denis L.: *See*—
McNamara, James R.; and Piazza, Denis L., 4,640,544, Cl. 296-181.000.

Pieck, Amandus L. E.: *See*—
Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., 4,641,009, Cl. 219-200.000.

Pieper, Norbert: *See*—
Kolb, Dieter; and Pieper, Norbert, 4,640,358, Cl. 192-70.180.

Pietzsch, Kurt E.; and Bonnyay, Laszlo, to Dorr-Oliver Incorporated. Vacuum filter for the separation of solids from liquids. 4,640,775, Cl. 210-387.000.

Pike, August A.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Pike, John V.: *See*—
Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., 4,640,485, Cl. 248-422.000.

Pinkel, Edward B.: *See*—
Moore, James G.; Obey, James H.; and Pinkel, Edward B., 4,640,740, Cl. 159-13.100.

Pioneer Ansafone Manufacturing Corporation: *See*—
Shibata, Junichi; and Kojima, Hiroshi, 4,641,116, Cl. 333-204.000.

Pioneer Electronic Corporation: *See*—
Hasegawa, Yonosuke, 4,641,363, Cl. 455-4.000.
Ikedo, Yuji; and Okajima, Takahiro, 4,641,298, Cl. 369-77.100.
Sawaki, Manabu, 4,641,068, Cl. 318-317.000.
Takahashi, Yoshio, 4,641,345, Cl. 381-86.000.
Tsuchiya, Yukio; and Matsukawa, Yutaka, 4,640,381, Cl. 181-144.000.

Pitel, Ira J., to Allied Corporation. Electrical power inverter having a phase modulated, twin-inverter, high frequency link and an energy storage module. 4,641,232, Cl. 363-71.000.

Pitney Bowes Inc.: *See*—
Clark, John I.; Eckert, Alton B.; and Warren, David M., 4,641,346, Cl. 380-3.000.
Clark, John I.; and Dlugos, Daniel F., 4,641,347, Cl. 380-3.000.
Cruz-Uribe, Antonio S., 4,641,153, Cl. 346-140.00R.
Doutney, George J., 4,640,599, Cl. 355-3.0CH.
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, 4,640,506, Cl. 271-212.000.

Pitt, Peter N. E. Time computer and display device. 4,640,624, Cl. 368-111.000.

Placke, Dale L.; and Weeks, Donald L., to NCR Corporation. Document guide mechanism. 4,640,505, Cl. 271-209.000.

Pless, Peter; and Andersen, Henning R. Esophageal electrode probe useful for electrical stimulation of the heart. 4,640,298, Cl. 128-784.000.

Podrini, Maurizio, to Centro Sperimentale Metallurgico S.p.A. Vertical cells for the continuous electrodeposition of metals at high current density. 4,640,757, Cl. 204-206.000.

Poland, Clark L.: *See*—
Laursen, Henning; Mosgaard, John; Nielson, Otto V.; and Poland, Clark L., 4,640,810, Cl. 264-518.000.

Poland, David A., to Northrop Corporation. Holding fixture. 4,640,501, Cl. 269-21.000.

Polaroid Corporation: *See*—
Alston, Lawrence E., 4,641,184, Cl. 358-75.000.
Alston, Lawrence E.; and Freeman, William T., 4,641,185, Cl. 358-75.000.
Rogers, Howard G., 4,640,482, Cl. 248-168.000.

Pollock, Ira G., to Tektronix, Inc. Digital integrated circuit propagation delay time controller. 4,641,048, Cl. 307-591.000.

Polson, Gary R., to Strength, Tech, Inc. Barbell collar. 4,639,979, Cl. 24-270.000.

Polychrome Corp.: *See*—
Rowe, William; and Dooley, Thomas, 4,640,884, Cl. 430-165.000.

Polydrain, Inc.: *See*—
Williams, Barry C., 4,640,643, Cl. 404-4.000.

Pomagalski SA: *See*—
Brian, Rene , 4,640,197, Cl. 104-179.000.

Pomernacki, Charles L.: *See*—
Tunnell, George; Pomernacki, Charles L.; and Gregg, Jack P., 4,641,292, Cl. 367-198.000.

Pons, Claude, to Videocolor. Method and apparatus for adjusting the static convergence and purity of color television tubes. 4,641,062, Cl. 315-368.000.

Pope, Paul B., to McConnell Dowell Constructors Limited. Joining means and method for joining metal members. 4,640,532, Cl. 285-41.000.

Popp, Robert L.: *See*—
Sallee, Lorry F.; and Popp, Robert L., 4,640,726, Cl. 156-85.000.

Porter, John F., to Bay Mills Limited. Facing for plastic foamed construction insulation board. 4,640,864, Cl. 428-334.000.

Porter, Richard M.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Portmann, Niklaus; and D'Aniello, Alfonso, to Elpatronic AG. Apparatus for electrical resistance seam welding by rollers. 4,641,008, Cl. 219-84.000.

Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., to Shell Oil Company. Process for the preparation of hydrocarbons. 4,640,766, Cl. 208-111.000.

Pourprix, Michel: *See*—
Burghoffer, Patrick; Pourprix, Michel; and Poussier, Patrick, 4,640,140, Cl. 73-863.220.

Poussier, Patrick: *See*—
Burghoffer, Patrick; Pourprix, Michel; and Poussier, Patrick, 4,640,140, Cl. 73-863.220.

Powell, Richard C.: *See*—
Trull, Michael W.; and Powell, Richard C., 4,640,137, Cl. 73-862.040.

Powers, Thomas, Jr.: *See*—
Flora, John H.; and Powers, Thomas, Jr., 4,640,132, Cl. 73-602.000.

Prameta Prazisionsmetall- und Kunststofferzeugnisse G. Baumann & Co.: *See*—
Sturm, Gerd-Jochen; and Wehking, Wolfgang, 4,640,281, Cl. 128-327.000.

Pratt & Whitney Canada Inc.: *See*—
Blizzard, Cyril A. M., 4,640,091, Cl. 60-39.290.

Pravda, Milton F., to Manco Corporation. Self-cleaning, rotary heat exchanger. 4,640,344, Cl. 165-86.000.

Predali, Jean-Jacques: *See*—
Beutier, Didier; and Predali, Jean-Jacques, 4,640,710, Cl. 75-108.000.

Premoli, Ercole: *See*—
Panizza, Ettore; and Premoli, Ercole, 4,640,557, Cl. 303-100.000.

Preston, Kendall, Jr. Logical transform image processor. 4,641,351, Cl. 382-6.000.

Price, J. B.: *See*—
Bunch, Matthew L.; Price, J. B.; and Stitz, Robert W., 4,640,224, Cl. 118-725.000.
Prickett, Robert J., to Raytheon Company. Broad beamwidth lens feed. 4,641,144, Cl. 343-754.000.
Prince Corporation: *See*—
Watjer, Sheldon J.; and Boerema, Edward T., 4,640,542, Cl. 296-37.800.
Printiss, Frederick H., Sr.; and Barker, Irvy T., to Nelson Industries, Inc. Tube clamp assembly. 4,640,536, Cl. 285-367.000.
Prior Scientific Instruments Limited: *See*—
Turner, Charles F. R.; and Wingfield, John V., 4,640,578, Cl. 350-239.000.
Pritchard, Dalton H., to RCA Corporation. Motion detector that extracts motion information from sidebands of a baseband television signal. 4,641,186, Cl. 358-105.000.
Procter & Gamble Company, The: *See*—
Drobish, James L., 4,640,442, Cl. 222-209.000.
Producers Color Service, Inc.: *See*—
Fedder, Stephen C.; and Skudrna, Anthony J., 4,641,152, Cl. 346-137.000.
Puchala, Ryszard J.; and Miko, Stephen J., to Indescor Hydrodynamics Inc. Method and apparatus for removal of surface material. 4,640,644, Cl. 404-75.000.
Purhonen, Hannu: *See*—
Tanner, Risto; and Purhonen, Hannu, 4,640,016, Cl. 33-356.000.
Purifoy, George G., Jr. Conversion adapter for buoyancy compensator vest. 4,640,215, Cl. 114-315.000.
Pusch, Gunter. Broad band camouflage screen having a frequency dependent radar attenuation. 4,640,851, Cl. 428-17.000.
Q-dot Corporation: *See*—
Grover, George M.; and Chrisman, Robert H., 4,640,347, Cl. 165-104.260.
Quick, David C.; McCormick, Stephen J.; and Ballendux, Gerardus M., to Deutz-Allis Corporation. Multi-speed planetary transmission. 4,640,152, Cl. 74-767.000.
Quillen, Jeffrey B.; and Spahn, James G. Recliner for medical convalescence. 4,639,960, Cl. 5-455.000.
Quinn, Bevan P. Disc pulverizer. 4,640,468, Cl. 241-199.100.
R. F. Shoup Corporation: *See*—
Boram, Robert J., 4,641,240, Cl. 364-409.000.
Boram, Robert J., 4,641,241, Cl. 364-409.000.
R. R. Brink Locking Systems, Inc.: *See*—
Kambic, Raymond V., 4,640,112, Cl. 70-452.000.
Rabito, Thomas G.: *See*—
Streets, Roger L.; Rabito, Thomas G.; and Peresie, David N., 4,640,730, Cl. 156-334.000.
Racal Data Communications Inc.: *See*—
Miller, William J., 4,641,302, Cl. 370-60.000.
Rache, Horst: *See*—
Habfast, Karl-Eugen; Kappus, Gunter; Rache, Horst; and Windel, Bernd, 4,641,029, Cl. 250-288.000.
Raciti, Salvatore: *See*—
Bertotti, Franco; Ferla, Giuseppe; Musumeci, Salvatore; and Raciti, Salvatore, 4,641,171, Cl. 357-46.000.
Radtke, Manfred, to MERO-Werke Dr.-Ing Max Mengeringhausen GmbH & Co. Self-supporting composite plate, especially for double floors. 4,640,854, Cl. 428-35.000.
Raether, Wolfgang: *See*—
Rosner, Manfred; and Raether, Wolfgang, 4,640,917, Cl. 514-222.000.
Ragazzoni, Silvio: *See*—
Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, 4,640,238, Cl. 123-90.550.
Rajotte, Paul T.: *See*—
Morris, Robert A.; and Rajotte, Paul T., 4,641,216, Cl. 361-45.000.
Morris, Robert A.; Rajotte, Paul T.; Russell, Ronald R.; and Kiesel, George W., 4,641,217, Cl. 361-45.000.
Ralph J. Stolle Company: *See*—
Short, Jimmie N., 4,641,078, Cl. 320-21.000.
Ram Automotive Company: *See*—
Norcia, John A.; Bickar, Ray; and Wheatley, William M., 4,640,323, Cl. 141-18.000.
Rammos, Emmanuel, to U.S. Philips Corporation. Microwave antenna having an array of radiating elements for circularly polarized signals. 4,641,145, Cl. 343-798.000.
Ramsden, Hugh E.; and Patterson, Joseph M., to J. T. Baker Chemical Company. Bonded phase of silica and carboalkoxyalkyl silanes for solid phase extraction. 4,640,909, Cl. 502-407.000.
Rancour, David P.: *See*—
Archambeault, Bruce R.; and Rancour, David P., 4,641,358, Cl. 382-68.000.
Ranks Hovis McDougall plc: *See*—
Roberts, David; and Williams, Michael R., 4,640,614, Cl. 356-36.000.
Rasmussen, James E.: *See*—
Mody, Dinesh I.; Rasmussen, James E.; and Ryaboy, Mikhail Y., 4,640,821, Cl. 422-81.000.
Rasmussen, Rolf B. Vacuum lift clamp device for handling of paper rolls. 4,640,661, Cl. 414-619.000.
Rasmussen, Vagn N.; and Hougaard, Finn, to Eskofot A/S. Reproduction camera. 4,640,610, Cl. 355-73.000.
Rasoul, Husam A. A., to Celanese Corporation. Benzothiazole-polyamide composition. 4,640,948, Cl. 524-157.000.
Rave, Ortwin: *See*—
Geller, Heinrich; Nold, Peter; Schermer, Heinz; and Rave, Ortwin, 4,640,447, Cl. 222-603.000.
Raven, Peter B.: *See*—
Meyer, Steven D.; and Raven, Peter B., 4,640,277, Cl. 128-204.230.
Ray, Dennis D.: *See*—
Clark, Roger L.; Ray, Dennis D.; and Martin, James L., 4,641,338, Cl. 379-328.000.
Raychaudhuri, Dipankar, to RCA Corporation. Announced retransmission random access system. 4,641,304, Cl. 370-95.000.
Raycom Systems, Inc.: *See*—
McConnell, Matthew L.; and Gibson, William A., 4,641,378, Cl. 455-619.000.
Raytheon Company: *See*—
Gill, Harry A., Jr., 4,641,108, Cl. 330-307.000.
Prickett, Robert J., 4,641,144, Cl. 343-754.000.
Sullivan, William B., Jr., 4,641,368, Cl. 455-239.000.
RCA Corporation: *See*—
Ackley, Donald E., 4,641,311, Cl. 372-18.000.
Belohoubek, Erwin F.; and Bechtle, Daniel W., 4,641,106, Cl. 330-286.000.
Beyers, Billy W., Jr., 4,641,205, Cl. 360-33.100.
Dischert, Robert A., 4,641,188, Cl. 358-140.000.
Dolny, Gary M.; and Goodman, Lawrence A., 4,641,164, Cl. 357-23.400.
Dwyer, Robert A.; and Ott, Russell G., 4,641,261, Cl. 364-900.000.
Easter, Finis C., 4,641,229, Cl. 363-21.000.
Hinn, Werner, 4,641,194, Cl. 358-242.000.
Jones, Theodore L., 4,640,725, Cl. 156-85.000.
Kalokitis, David, 4,641,107, Cl. 330-286.000.
Marchegiano, Joseph E.; and Baran, Anthony S., 4,641,256, Cl. 364-525.000.
Mastroianni, Anthony R., 4,641,130, Cl. 340-347.0AD.
Montini, Charles, Jr., 4,641,365, Cl. 455-78.000.
Pritchard, Dalton H., 4,641,186, Cl. 358-105.000.
Raychaudhuri, Dipankar, 4,641,304, Cl. 370-95.000.
Sterzer, Fred, 4,640,280, Cl. 128-804.000.
Testin, William J.; and French, Michael P., 4,641,064, Cl. 315-411.000.
Testin, William J.; and Tults, Juri, 4,641,190, Cl. 358-165.000.
Whitehead, James M. M., 4,641,123, Cl. 338-128.000.
Redding, Thomas P.; and Barker, Laurence S., to Xerox Corporation. Sheet feeder-stacker. 4,640,602, Cl. 355-3.0SH.
Refac Electronics Corporation: *See*—
Danby, Philip, 4,641,090, Cl. 324-107.000.
Reger, Philip R., to American Manufacturing Company, Inc. Condition-responsive switching circuit. 4,641,132, Cl. 340-540.000.
Regimand, Ali, to Troxler Electronic Laboratories, Inc. Apparatus and method for directly measuring the density of a thin layer. 4,641,030, Cl. 250-308.000.
Reich, William N., to Spectrolyte, Inc. Microscope illuminator. 4,640,589, Cl. 350-523.000.
Reichle & De Massari AG Elektro-Ingenieure: *See*—
Reichle, Hans, 4,641,225, Cl. 361-429.000.
Reichle, Hans, to Reichle & De Massari AG Elektro-Ingenieure. Distributor frame for low-current electrical circuits formed from channels. 4,641,225, Cl. 361-429.000.
Reimer, William A., to GTE Communication Systems Corporation. Electromagnetic interference reducing assembly. 4,641,224, Cl. 361-424.000.
Reinking, Klaus: *See*—
Zecher, Wilfried; Reinking, Klaus; and Kleiner, Frank, 4,640,970, Cl. 528-73.000.
Rempfler, Hermann: *See*—
Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, 4,640,703, Cl. 71-92.000.
Renan, Patrice: *See*—
Badin, Suzan; Moulin, Jean-Francois; Delattre, Luc; and Renan, Patrice, 4,640,055, Cl. 51-101.0LG.
Renn, Gregory J.: *See*—
McMahon, Raymond D.; Jellovitz, John C.; Vaile, James T.; Renn, Gregory J.; and Ondeck, Elmer J., 4,640,165, Cl. 83-346.000.
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., to Battelle Memorial Institute. Indicating positions. 4,641,027, Cl. 250-237.00G.
Research Development Corp.: *See*—
Nakagawa, Takeo; and Suzuki, Kiyoshi, 4,640,156, Cl. 82-1.00C.
Reuter, Karl F.: *See*—
Gallion, Georg A.; Bratke, Dieter N.; Helbig, Klaus; and Reuter, Karl F., 4,640,450, Cl. 224-331.000.
Rexair, Inc.: *See*—
Erickson, Roy O., Jr., 4,640,697, Cl. 55-248.000.
Rheinmetall GmbH: *See*—
Witt, Wolfram; and Scholles, Herbert, 4,640,194, Cl. 102-425.000.
Rheometrics, Inc.: *See*—
Garritano, Ronald F.; O'Connor, John J.; and Papayanopulos, Manuel E., 4,640,120, Cl. 73-12.000.
Rhine, Art. Mechanical roping steer. 4,640,515, Cl. 273-339.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Cavezzan, Jacques; and Soula, Gerard, 4,640,939, Cl. 522-99.000.
Dupin, Thierry, 4,640,908, Cl. 502-243.000.
Richard Wolf GmbH: *See*—
Diener, Jorg; and Bitrolf, Ehrenfried, 4,640,124, Cl. 73-116.000.

Richardson, Daniel E., to Shure Manufacturing Corporation. Pass-through transaction drawer with removable deal tray. 4,640,200, Cl. 109-19.000.
Richter, Hans-Peter, to Robert Bosch GmbH. Electronic circuit apparatus for separating the luminance and color information of a color television signal. 4,641,180, Cl. 358-31.000.
Richter, Wolfgang; and Durl, Bernd, to Hoechst Aktiengesellschaft. Pad dyeing process for wool. 4,640,691, Cl. 8-543.000.
Ricoh Company, Ltd.: *See*—
Ariyama, Kenzo; Kurotori, Tsuneo; and Mochizuki, Manabu, 4,640,605, Cl. 355-4.000.
Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, 4,640,608, Cl. 355-15.000.
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.
Sasaki, Tomio; and Noguchi, Yukio, 4,641,272, Cl. 364-559.000.
Riederer, Stephen J., to Duke University Medical Center. Determination of T1 relaxation times used in automated nuclear magnetic resonance image synthesis. 4,641,095, Cl. 324-309.000.
Rieter Machine Works: *See*—
Stalder, Herbert; Baumgartner, Josef; and Wurmli, Arthur, 4,640,089, Cl. 57-401.000.
Riherd, David M.: *See*—
Dyer, Stanley; Molloy, James J.; Nguyen, Thoi; Riherd, David M.; Voit, William F., Jr.; and West, Donald L., 4,641,148, Cl. 346-76.0PH.
Rijckaert, Josephus F.: *See*—
Sanders, Rudolf; and Rijckaert, Josephus F., 4,641,056, Cl. 313-51.000.
Riner, Wilbur L.; and Watson, Bruce W., to Asher Technologies, Inc. Communications unit for executive work station. 4,640,989, Cl. 379-94.000.
Rinnai Kabushiki Kaisha: *See*—
Kato, Hiroyuki; and Yamana, Toshifumi, 4,640,261, Cl. 126-39.00J.
Riseman, Jacob: *See*—
Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Shepard, Joseph F., 4,641,170, Cl. 357-35.000.
Risser, Dale M.: *See*—
Martin, Eugene G.; and Risser, Dale M., 4,639,972, Cl. 17-11.000.
Ritchie, Ian T., to Andus Corp. Optical recording coating. 4,640,860, Cl. 428-143.000.
RIV-SKF Officine di Villar Perosa S.p.A.: *See*—
Camosso, Domenico; Colanzi, Franco; and Ragazzoni, Silvio, 4,640,238, Cl. 123-90.550.
Rivera, Jeremias C., Jr., to Scully-Jones Corp. Coolant delivery system. 4,640,652, Cl. 409-136.000.
Rivett, Paul W. J.: *See*—
Eastwood, H. Keith; and Rivett, Paul W. J., 4,640,576, Cl. 350-96.230.
Robert Bosch GmbH: *See*—
Bertling, Hannes; and Leiber, Heinz, 4,640,555, Cl. 303-10.000.
Hafele, Walter; Kramer, Manfred; Schmieder, Dietmar; and Warga, Johann, 4,640,255, Cl. 123-495.000.
Kuhbauch, Gerd, 4,639,966, Cl. 15-250.230.
Mattes, Bernhard; Mausner, Eberhard; and Suchowerskyj, Wadym, 4,641,041, Cl. 307-10.00R.
Modic, Fedor; Leibfried, Wolfgang; Nitsch, Manfred; Spitzenberger, Kurt; and Zimmermann, Herbert, 4,640,739, Cl. 156-659.100.
Richter, Hans-Peter, 4,641,180, Cl. 358-31.000.
Roberts & Associates Water and Waste Treatment Limited: *See*—
Roberts, Charles G., 4,640,307, Cl. 137-448.000.
Roberts, Bobby S. Muscular rehabilitation apparatus for exercising human body appendages. 4,640,268, Cl. 128-25.00R.
Roberts, Charles G., to Roberts & Associates Water and Waste Treatment Limited. Float valve. 4,640,307, Cl. 137-448.000.
Roberts, David; and Williams, Michael R., to Ranks Hovis McDougall plc. Testing samples. 4,640,614, Cl. 356-36.000.
Roberts, Ernest E.; Hansel, Paul H.; and Hudgens, William O., to Atlantic Richfield Company. Method and apparatus for assembling large panels. 4,640,734, Cl. 156-562.000.
Roberts, Melvin F., to Bloomfield Industries, Inc. Improved safety thermostat system for electric beverage making device. 4,641,011, Cl. 219-328.000.
Roberts, Melvin F., to Bloomfield Industries, Inc. Thermostat sensing tube and mounting system for electric beverage making device. 4,641,012, Cl. 219-331.000.
Roberts, W. F. Dual purpose closure for heat exchangers. 4,640,348, Cl. 165-158.000.
Robertshaw Controls Company: *See*—
Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., 4,640,676, Cl. 431-54.000.
McIntosh, Harold A., 4,641,223, Cl. 361-424.000.
Robin-Champigneul, Yves: *See*—
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Robinton, Michael A., to Robinton Products, Inc. Telephone interrupter. 4,640,988, Cl. 379-90.000.
Robinton Products, Inc.: *See*—
Robinton, Michael A., 4,640,988, Cl. 379-90.000.
Robotic Vision Systems, Inc.: *See*—
Schmidt, Richard, 4,640,620, Cl. 356-376.000.
Roca, Abel. Wave generator for waterbeds. 4,639,959, Cl. 5-451.000.
Rocca, Jorge J.: *See*—
Collins, George J.; Rocca, Jorge J.; and Meyer, Jack D., 4,641,316, Cl. 372-74.000.
Rockaway Corporation: *See*—
Varga, LeRoy M.; and Yermal, Michael F., 4,640,321, Cl. 140-93.00C.
Rockwell International Corporation: *See*—
Dumas, Theodore A., 4,640,575, Cl. 350-96.200.
Johnsen, Kenneth D.; and Fletcher, Alan J., 4,640,434, Cl. 220-287.000.
Lange, Fred F., 4,640,902, Cl. 501-97.000.
Tracy, John M.; Yeh, Pochi A.; and Khoshnevisan, Mohsen, 4,640,618, Cl. 356-345.000.
Rockwell-Rimoldi S.p.A.: *See*—
Santalini, Antonio, 4,640,397, Cl. 192-18.00B.
Rodboon, Somsak S.: *See*—
Files, William C.; Pellerin, Norvin L.; Rodboon, Somsak S.; and Pearce, Thomas M., 4,640,024, Cl. 34-133.000.
Rogers, Howard G., to Polaroid Corporation. Foldable tripod. 4,640,482, Cl. 248-168.000.
Rohm GmbH: *See*—
Schnee, Reiner; Pennewiss, Horst; and Markert, Gerhard, 4,640,954, Cl. 524-516.000.
Rohr, William A.: *See*—
Hemler, Paul F.; and Rohr, William A., 4,640,499, Cl. 267-160.000.
Roller, Erling: *See*—
Clark, Peter J.; Hudd, Anthony W.; Bloor, Stephen T.; and Roller, Erling, 4,640,335, Cl. 164-440.000.
Romenesko, David J.: *See*—
Groenhof, Eugene D.; Romenesko, David J.; and Streu, Rick D., 4,640,792, Cl. 252-78.300.
Romer, Manfred; Woletz, Peter; and Kruger, Klaus, to Morton Thiokol GmbH. Radiation-curable composition, a process for preparing same, and the use thereof. 4,640,938, Cl. 522-79.000.
Romo, H. Duane. Insert for converting a conventional home oven into a pizza oven. 4,640,265, Cl. 126-337.00R.
Rooney, John M.: *See*—
Woods, John G.; and Rooney, John M., 4,640,849, Cl. 427-54.100.
Rosback, Thomas J., to Harris Corporation. Multi-band automatic gain control apparatus. 4,641,361, Cl. 381-103.000.
Roschmann, Klaus: *See*—
Knothe, Herbert; and Roschmann, Klaus, 4,640,745, Cl. 204-5.000.
Rose, Millard F., to United States of America, Navy. Gun-firing system. 4,640,180, Cl. 89-8.000.
Rose, Philip M.: *See*—
Kreider, David R.; McCullum, Albert; Rose, Philip M.; and Lin, Chi-Hung, 4,640,963, Cl. 526-67.000.
Rose, Richard C., to AT&T Information Systems Inc. Speech response interface circuit. 4,640,992, Cl. 379-89.000.
Rose, Thomas H., to Eastern Technical Associates, Inc. Transmissometer and optical elements therefor. 4,640,621, Cl. 356-434.000.
Rosenberg, Harvey S., to Battelle Memorial Institute. Process for simultaneous removal of SO_2 and NO_x from gas streams. 4,640,825, Cl. 423-235.000.
Rosner, Manfred; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. 2-phenyl-hexahydro-1,2,4-triazine-3,5-diones. 4,640,917, Cl. 514-222.000.
Ross, Frank E.; and Hunter, William H., to Maytag Company, The. Rotating antenna for a microwave oven. 4,641,006, Cl. 219-10.55F.
Rouaud, Christian: *See*—
Abbes, Claude; Rouaud, Christian; Valla, Jean; Forges, Robert; and de Villepoix, Raymond, 4,640,530, Cl. 285-18.000.
Rovedo, Nivo: *See*—
Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Shepard, Joseph F., 4,641,170, Cl. 357-35.000.
Rowe, Lacy A. Fishing lure. 4,640,042, Cl. 43-42.150.
Rowe, William; and Dooley, Thomas, to Polychrome Corp. Photosensitive compounds and lithographic composition or plate therewith having o-quinone diazide sulfonyl ester group. 4,640,884, Cl. 430-165.000.
Roy, Richard D., to Eaton Corporation. AC to DC converter with voltage regulation. 4,641,233, Cl. 363-89.000.
Rozenwaig, Boris; and Robin-Champigneul, Yves. Multi-channel multicell optoelectronic switching networks for multi-service telecommunications systems. 4,641,376, Cl. 455-607.000.
Rubik, Erno, to Kozponti Valto-es Hitelbank Rt. Framework truss with variable cantilever length. 4,640,062, Cl. 52-109.000.
Rubin, Mae K., to Mobil Oil Corporation. Synthesis of crystalline silicate ZSM-50 using dibenzyldimethylammonium ions and the product produced. 4,640,829, Cl. 423-328.000.
Ruderian, Max J. Hot and cold direct contact applicator. 4,640,284, Cl. 128-399.000.
Rudis, Thomas C.: *See*—
Marino, Michael; and Rudis, Thomas C., 4,640,427, Cl. 215-232.000.
Runyon, Robert C., to Substrate Systems, Inc. Computer memory disc and method for machining same. 4,640,651, Cl. 409-132.000.
Rupprecht, Karl, to Claas Ohg. Harvester thresher. 4,640,085, Cl. 56-14.600.
Rush, William F.; Huebler, James E.; and Lysenko, Peter, to Institute of Gas Technology. Photoacoustic speaker and method. 4,641,377, Cl. 381-111.000.
Rushford, Calvin R., to Indal, Inc. Revolving door collapsing mechanism. 4,640,046, Cl. 49-44.000.
Russell, Brian M., to International Computers Limited. Data packet transmission using shared channel. 4,641,307, Cl. 370-60.000.

Russell, Ronald R.: *See*—
Morris, Robert A.; Rajotte, Paul T.; Russell, Ronald R.; and Kiesel, George W., 4,641,217, Cl. 361-45.000.

Russo, Vitaliano: *See*—
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Ryaboy, Mikhail Y.: *See*—
Mody, Dinesh I.; Rasmussen, James E.; and Ryaboy, Mikhail Y., 4,640,821, Cl. 422-81.000.

Ryobi Ltd.: *See*—
Murakami, Hideo; and Kobayashi, Takehiro, 4,640,471, Cl. 242-84.530.

Rzeszewski, Theodore S.: *See*—
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,641,179, Cl. 358-12.000.

S. C. Johnson & Son, Inc.: *See*—
Harris, Robert B., 4,640,713, Cl. 106-3.000.

S.R. Gent plc: *See*—
O'Keefe, Michael; and Fox, John R., 4,640,207, Cl. 112-236.000.

Saab Marine Electronics Aktiebolag: *See*—
Edvardsson, Kurt O., 4,641,139, Cl. 342-124.000.

Saab-Scania Aktiebolag: *See*—
Jansch, Peter A. G., 4,640,126, Cl. 73-290.00R.

Sacarisen, Stephen P.; and Fanini, Otto N., to Texas Instruments Incorporated. Method of internal self-test of microprocessor using microcode. 4,641,308, Cl. 371-16.000.

Sach, George S., to Smith Kline & French Laboratories Limited. 3,5-Substituted-2-pyridylalkylaminothiadiazoles having histamine H_1-antagonist activity. 4,640,926, Cl. 514-333.000.

Saegusa, Noboru: *See*—
Yotsutani, Akio; Makino, Masayuki; Saegusa, Noboru; and Sone, Tomoshi, 4,640,986, Cl. 379-60.000.

Safir, Aran: *See*—
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Sagawa, Koichiro: *See*—
Meguro, Kenjiro; Sagawa, Koichiro; Yokota, Hirofumi; and Takehara, Masahiro, 4,640,943, Cl. 523-200.000.

Sage Laboratories, Inc.: *See*—
Chapell, Harry F., 4,641,111, Cl. 333-115.000.

Sahara, Masanori: *See*—
Nakamura, Saburo; Matsuoka, Tsutomu; Yamauchi, Hirofumi; and Sahara, Masanori, 4,640,252, Cl. 123-446.000.

St. Clair, David L., to Owens-Illinois, Inc. Plastic container with integral spout. 4,640,855, Cl. 428-36.000.

Saito, Gunji, to Honda Giken Kogyo Kabushiki Kaisha. Cultivator. 4,640,366, Cl. 172-42.000.

Saito, Susumu: *See*—
Kataoka, Keiji; and Saito, Susumu, 4,640,573, Cl. 350-6.100.

Saito, Teruo; Asai, Kuniaki; Suzuki, Yasuro; and Kagiya, Kei, to Sumitomo Chemicial Company, Limited. Resin composition. 4,640,961, Cl. 525-444.000.

Saito, Tomotaka, to Kabushiki Kaisha Toshiba. Memory device with a register interchange function. 4,641,278, Cl. 365-78.000.

Saito, Yukio: *See*—
Okita, Masao; Gunji, Kunihiko; and Saito, Yukio, 4,641,211, Cl. 360-97.000.

Sakagami, Shigeru: *See*—
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki, 4,641,065, Cl. 318-135.000.

Sakaguchi, Kenichi: *See*—
Takeda, Hiroshi; Oshima, Noritsugu; Kubo, Tateo; and Sakaguchi, Kenichi, 4,640,673, Cl. 425-297.000.

Sakai, Hiroyuki: *See*—
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,640,699, Cl. 65-3.150.

Sakai, Noboru: *See*—
Inoue, Fumio; Eto, Masahiro; Shimaoka, Shoei; and Sakai, Noboru, 4,641,195, Cl. 358-242.000.

Sakai, Yukiyoshi: *See*—
Takahata, Daisuke; and Sakai, Yukiyoshi, 4,641,054, Cl. 310-324.000.

Sakamoto, Koji: *See*—
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, 4,640,129, Cl. 73-866.000.

Sakamoto, Takahide; Hiroshima, Tatsuo; Matsubara, Noriyuki; and Miyata, Kenichi, to Sumitomo Metal Industries, Ltd. Rotary probe apparatus for detecting flaws in a test object. 4,641,092, Cl. 324-227.000.

Sakamoto, Takao, to Tachikawa Spring Co., Ltd. Seat suspension. 4,640,488, Cl. 248-588.000.

Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, to Tokyo Electric Co., Ltd. Thermal printer. 4,641,147, Cl. 346-76.0PH.

Sakurai, Masaaki: *See*—
Hirabayashi, Hiromitsu; and Sakurai, Masaaki, 4,640,600, Cl. 355-3.0FU.

Sakurai, Yasuo: *See*—
Imanishi, Kiyokazu; Naka, Hiroyuki; Sakurai, Yasuo; Ichiyanagi, Takashi; and Kishimoto, Masaru, 4,641,214, Cl. 360-130.240.

Salentine, Christopher G., to Chevron Research Company. Trihydrated potassium triborate and process for reacting two borates in the solid state. 4,640,827, Cl. 423-279.000.

Salje, Ernst. Dressing-grinding process and electronically controlled grinding machine. 4,640,057, Cl. 51-165.870.

Sallee, Lorry F.; and Popp, Robert L., to Kimberly-Clark Corporation. Heat activation process and apparatus for heat shrinkable material. 4,640,726, Cl. 156-85.000.

Salter, Anthony J. Pipe supports. 4,640,487, Cl. 248-571.000.

Salvatora, David A.: *See*—
Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,815, Cl. 419-8.000.
Haswell, Walter T., Jr.; Brosius, Karl S.; Justus, Scott B.; and Salvatora, David A., 4,640,814, Cl. 419-8.000.

Sameca S.A.: *See*—
Geiser, Markus; and Vandevoir, Claude, 4,640,157, Cl. 82-2.700.

Sampath, Krishnaswamy, to Mobil Oil Corporation. Oil recovery process employing a complexed polysaccharide. 4,640,358, Cl. 166-274.000.

Samsonite Corporation: *See*—
Mobley, Lawrence R.; and Gregg, James S., 4,640,414, Cl. 206-287.000.

Sanders Associates, Inc.: *See*—
Apostolos, John T., 4,641,143, Cl. 342-445.000.

Sanders, Michael J.: *See*—
Cerdan-Diaz, Juan M.; Sanders, Michael J.; and Wellar, Mark E., 4,640,848, Cl. 427-426.000.

Sanders, Rudolf; and Rijckaert, Josephus F., to U.S. Philips Corporation. Plastic-based automotive headlamp. 4,641,056, Cl. 313-51.000.

Sandhaus, Jeffrey. Closure having integral formed sealing means. 4,640,429, Cl. 215-320.000.

Sandomirsky, Sergei G.: *See*—
Melgui, Mikhail A.; and Sandomirsky, Sergei G., 4,641,093, Cl. 324-239.000.

Sanger, David G.: *See*—
Kind, Stuart S.; Sanger, David G.; Twibell, John D.; and Hargraves, John, 4,640,035, Cl. 40-625.000.

Sani-Fresh International, Inc.: *See*—
Bokmiller, David J.; and Heck, Samuel C., 4,640,638, Cl. 401-145.000.

Sano, Akira: *See*—
Mori, Masaaki; Sano, Akira; Horiuchi, Yushi; and Okumura, Yoshihiro, 4,640,023, Cl. 34-57.00A.

Santalini, Antonio, to Rockwell-Rimoldi S.p.A. Electromechanical friction brake for actuating and stopping a rotating element in predetermined positions. 4,640,397, Cl. 192-18.00B.

Santel, Hans-Joachim: *See*—
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hansler, Gerd, 4,640,923, Cl. 514-272.000.

Sanyo Electric Co., Ltd.: *See*—
Deguchi, Yutaka; and Tsuchida, Yasuyuki, 4,640,601, Cl. 355-3.00R.
Suzuki, Masami; Hirota, Tatsuya; and Maeda, Masahiko, 4,640,022, Cl. 34-48.000.
Tajima, Osamu; Yamada, Makoto; Hagino, Hideo; and Nishizawa, Nobuyoshi, 4,640,873, Cl. 429-24.000.

Sara Lee Corporation: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.

Sarkis S.A.: *See*—
Moraly, Paul, 4,640,371, Cl. 175-61.000.

Sasaki, Issei, to Sasaki, Issei; and Seiko Instruments & Electronics Ltd., a part interest. Liquid refractometer. 4,640,615, Cl. 356-130.000.

Sasaki, Takeshi: *See*—
Matsushima, Katsuaki; Fujioka, Yasuhiro; Sasaki, Takeshi; Fujine, Manabu; and Yamamoto, Kouji, 4,640,184, Cl. 98-2.150.

Sasaki, Tomio; and Noguchi, Yukio, to Ricoh Company, Ltd. Device for sensing sheet transport condition. 4,641,272, Cl. 364-559.000.

Sasaki, Toshiki: *See*—
Nakamura, Chiaki; Oe, Koji; Muta, Tomonobu; Sasaki, Toshiki; and Nishio, Yoshihiro, 4,640,887, Cl. 430-275.000.

Sasaki, Yukio; Nishimura, Kotaro; and Minato, Osamu, to Hitachi, Ltd. Line change-over circuit and semiconductor memory using the same. 4,641,285, Cl. 365-210.000.

SASIB S.p.A.: *See*—
Cristian, Athos, 4,640,013, Cl. 131-94.000.

Sato, Akira: *See*—
Nagai, Takaatsu; Takada, Masayuki; Sato, Akira; and Imamura, Mineo, 4,641,319, Cl. 373-84.000.

Sato, Kimiaki: *See*—
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,641,166, Cl. 357-23.600.

Sato, Kiyoshi: *See*—
Mochida, Kenichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, 4,640,919, Cl. 514-241.000.

Sato, Kozo: *See*—
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, 4,640,892, Cl. 430-617.000.
Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, 4,640,891, Cl. 430-551.000.

Sato, Masaki, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device. 4,640,000, Cl. 29-571.000.

Sato, Noboru, to Sony Corporation. Method for producing magnetic medium. 4,640,755, Cl. 204-192.200.

Sato, Ryo: *See*—
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,640,707, Cl. 71-96.000.

Sato, Ryoichi; and Mimoto, Toshio, to Sharp Kabushiki Kaisha. Semiconductor circuit of MOS transistors for generation of reference voltage. 4,641,081, Cl. 323-313.000.

Sato, Shigeru: *See*—
Fujii, Hideji; Hayakawa, Takayuki; Sato, Shigeru; and Yanagihara, Eiichi, 4,640,729, Cl. 156-257.000.
Sato, Shinsaku; and Yamagata, Ichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Methods of controlling operation of multistage hydraulic machines. 4,640,664, Cl. 415-1.000.
Sato, Yasuo: *See*—
Mitsudera, Hiroyuki; Konishi, Kazuo; and Sato, Yasuo, 4,640,929, Cl. 514-436.000.
Sato, Yoshiyuki: *See*—
Kawade, Hideji; Takahashi, Hideaki; Sato, Yoshiyuki; and Urayama, Yuji, 4,640,990, Cl. 379-77.000.
Satoh, Junichi, to International Business Machines Corp. Method for reading a document image. 4,641,357, Cl. 382-61.000.
Satomura, Shigeyuki: *See*—
Inazawa, Yoshizumi; Takahashi, Toshihiko; Tani, Toshiyuki; and Satomura, Shigeyuki, 4,641,208, Cl. 360-72.200.
Sauer, John E.: *See*—
Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., 4,640,463, Cl. 239-424.000.
Saumweber, Eckart; and Schmitt, Otto, to Knorr-Bremse AG. Brake lining carrier for disk brakes having divided lining elements. 4,640,390, Cl. 188-73.370.
Saunders, Randy: *See*—
Martin, Frank J.; Hartman, Murray; and Saunders, Randy, 4,640,985, Cl. 174-138.00F.
Sawa, Shigeki; and Ueda, Hiroshi, to Shibuya Kogyo Co. Ltd. Method of curing athlete's foot by laser beam irradiation. 4,640,283, Cl. 128-395.000.
Sawada, Hideo: *See*—
Yata, Kiyoshi; and Sawada, Hideo, 4,641,277, Cl. 364-900.000.
Sawada, Kenji, to Fujitsu Limited. Stepper motor control system. 4,641,073, Cl. 318-696.000.
Sawada, Kozo: *See*—
Hashimoto, Masashi; Aratani, Matsuhiko; and Sawada, Kozo, 4,640,915, Cl. 514-210.000.
Sawaki, Manabu, to Pioneer Electronic Corporation. DC motor driving device. 4,641,068, Cl. 318-317.000.
Sawyer, James L.: *See*—
Heitzmann, Richard E.; Fitzgerald, Mark; and Sawyer, James L., 4,640,715, Cl. 106-85.000.
Sawyer, Steven D.; Hill, William D.; Wilson, Patricia A.; and Steiner, William M., to General Electric Company. Nuclear system test simulator. 4,640,812, Cl. 376-245.000.
Scalera, Michael, to AT&T Bell Laboratories. Protector with circuit disabler. 4,641,218, Cl. 361-119.000.
Scan Web of North America, Inc.: *See*—
Laursen, Henning; Mosgaard, John; Nielson, Otto V.; and Poland, Clark L., 4,640,810, Cl. 264-518.000.
Scarinci, Fernando: *See*—
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.
Schafer, David E.: *See*—
Grabiak, Raymond C.; Howe, Robert K.; and Schafer, David E., 4,640,702, Cl. 71-90.000.
Schafer, Fritz P.; Szatmari, Sandor; and Bor, Zsolt, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Method and device for producing individual short laser pulses. 4,641,312, Cl. 372-25.000.
Schaich, Josef. Four stroke piston engine. 4,640,237, Cl. 123-79.00C.
Schartzman, Everett H. Integral spring flexure for use with high speed rotating shafts. 4,640,653, Cl. 409-233.000.
Schaub, Robert E.: *See*—
Wissner, Allan; Schaub, Robert E.; and Sum, Phaik E., 4,640,913, Cl. 514-77.000.
Schaublin, Donna S.: *See*—
Schaublin, John M.; and Schaublin, Donna S., 4,640,109, Cl. 70-202.000.
Schaublin, John M.; and Schaublin, Donna S. Removable latch handle locking device. 4,640,109, Cl. 70-202.000.
Schellstede, Herman J. Well penetration apparatus and method. 4,640,362, Cl. 166-298.000.
Schenck, John F.: *See*—
Bottomley, Paul A.; and Schenck, John F., 4,641,097, Cl. 324-318.000.
Schermer, Heinz: *See*—
Geller, Heinrich; Nold, Peter; Schermer, Heinz; and Rave, Ortwin, 4,640,447, Cl. 222-603.000.
Schieber, Hans, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG. Double head flat knitting machine. 4,640,103, Cl. 66-64.000.
Schiel, Christian; and Bauder, Albrecht, to J. M. Voith GmbH. Roll for treating webs, preferably webs of paper. 4,639,990, Cl. 29-116.00R.
Schiele, August; and Huber, Wolfgang, to Kuka Wehrtechnik GmbH. Automatic gun loading device for a tank. 4,640,181, Cl. 89-46.000.
Schilling, Thaddeus A. Portable gas-fired forced-draft heater. 4,640,680, Cl. 431-350.000.
Schimmel, Gunther; and Gradl, Reinhard, to Hoechst Aktiengesellschaft. Process for making alkali metal phosphate solutions containing little fluorine. 4,640,824, Cl. 423-185.000.
Schirmer, Henry G.: *See*—
Ferguson, Daniel J.; Schirmer, Henry G.; and Mueller, Walter B., 4,640,856, Cl. 428-36.000.
Schlag, Johannes: *See*—
Naarmann, Herbert; Koehler, Gernot; and Schlag, Johannes, 4,640,749, Cl. 204-59.00R.
Schlesinger, Eugene R., to Perkin-Elmer Corporation, The. Optical chopper with high rate of focus dither. 4,640,580, Cl. 350-274.000.
Schlumberger Canada Limited: *See*—
Martin, Frank J.; Hartman, Murray; and Saunders, Randy, 4,640,985, Cl. 174-138.00F.
Schlumberger Technology Corporation: *See*—
Boisson, Gerard, 4,640,354, Cl. 166-250.000.
Schmalzl, Dieter, to Siemens Aktiengesellschaft. Radio-frequency-tight shield with planar parts. 4,640,979, Cl. 174-35.0GC.
Schmeal, W. R.; Singhal, S. N.; and Lo, K. H., to Shell Oil Company. Fiber wound plastic beverage can. 4,640,853, Cl. 428-35.000.
Schmid, Dieter, to Lescha Maschinenfabrik GmbH. Chopper for garden refuse or the like. 4,640,465, Cl. 241-37.500.
Schmid, Ralf; Otto, Johann; Bernklau, Daniela; and Knapek, Erwin, to Siemens Aktiengesellschaft. Method and apparatus for localizing weak points within an electrical circuit. 4,640,626, Cl. 374-57.000.
Schmidt, Eugene H. Row following guidance device for a tractor-drawn row crop implement. 4,640,365, Cl. 172-26.000.
Schmidt-Kufeke, Klaus-Peter; and Feld, Gerhard. Tubular ventilator. 4,640,803, Cl. 261-64.300.
Schmidt, Lothar, to Leybold-Heraeus GmbH. Method for the processing of measurement data in a gas friction vacuum meter and a gas friction vacuum meter equipped with a circuit for the practice of this method. 4,640,136, Cl. 73-753.000.
Schmidt, Richard, to Robotic Vision Systems, Inc. Arrangement for rapid depth measurement using lens focusing. 4,640,620, Cl. 356-376.000.
Schmidt, Robert R.: *See*—
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, 4,640,923, Cl. 514-272.000.
Schmieder, Dietmar: *See*—
Hafele, Walter; Kramer, Manfred; Schmieder, Dietmar; and Warga, Johann, 4,640,255, Cl. 123-495.000.
Schmitt, Otto: *See*—
Saumweber, Eckart; and Schmitt, Otto, 4,640,390, Cl. 188-73.370.
Schnee, Reiner; Pennewiss, Horst; and Markert, Gerhard, to Rohm GmbH. Polymer suspension containing a water-soluble polymer suspended in an oil phase. 4,640,954, Cl. 524-516.000.
Schneider, Dieter, to VDO Adolf Schindling AG. Electrothermal measurement of levels compensated for ambient temperature. 4,640,127, Cl. 73-295.000.
Schneider, Ira H.: *See*—
Bryan, Barry L.; Druckerman, Martin; McDowell, Allen W.; Schneider, Ira H.; and Newkirk, Gary L., 4,641,262, Cl. 364-900.000.
Schnepp-Pesch, Wolfram; and Lindenberg, Josef. Biopsy cannula. 4,640,296, Cl. 128-754.000.
Scholles, Herbert: *See*—
Witt, Wolfram; and Scholles, Herbert, 4,640,194, Cl. 102-425.000.
Schott Glaswerke: *See*—
Neuroth, Norbert, 4,641,187, Cl. 358-106.000.
Schou, Carl E. Self-locking differential with hexagonal drive rod. 4,640,143, Cl. 74-650.000.
Schouhamer Immink, Kornelis A., to U.S. Philips Corporation. Method of encoding a stream of data bits, arrangement for performing the method and arrangement for decoding the stream of channel bits obtained in accordance with this method. 4,641,128, Cl. 340-347.0DD.
Schraff, Raymond J.; Miller, Thomas M.; and Labas, Nicholas, to ELTECH Systems Corporation. Readily repairable and lightweight cover for a heated vessel. 4,640,202, Cl. 110-336.000.
Schram, David N.: *See*—
Nobel, Fred I.; and Schram, David N., 4,640,746, Cl. 204-15.000.
Schroder, Hans L., to Du Pont de Nemours, E. I., and Company. Process for the ozone protection by photopolymer-flexoprinting plates by alcohol-soluble polyamides. 4,640,877, Cl. 430-14.000.
Schuettenberg, Alexander D., to Phillips Petroleum Company. Gasoline compositions containing branched chain amines or derivatives thereof. 4,640,787, Cl. 252-51.50A.
Schuh, Frank J., to Atlantic Richfield Company. Electrode well and method of completion. 4,640,353, Cl. 166-248.000.
Schultz, Gary R.: *See*—
Braun, Eugene R.; and Schultz, Gary R., 4,640,331, Cl. 152-417.000.
Schulz, Peter: *See*—
Stusack, Hans; and Schulz, Peter, 4,640,167, Cl. 83-649.000.
Schurter, Rolf: *See*—
Bohner, Beat; Rempfler, Hermann; and Schurter, Rolf, 4,640,703, Cl. 71-92.000.
Schutz-Werke GmbH & Co. KG: *See*—
Namur, Marc, 4,640,211, Cl. 114-97.000.
Schwabe, Ulrich: *See*—
Neppl, Franz; Schwabe, Ulrich; and Hieber, Konrad, 4,640,844, Cl. 427-38.000.
Schwamborn, Michael; Kuhle, Engelbert; Klauke, Erich; Eue, Ludwig; Schmidt, Robert R.; Santel, Hans-Joachim; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Methods of combatting fungi employing 2,4-diamino-6-halogeno-5-alkylthio-pyrimidines. 4,640,923, Cl. 514-272.000.
Schwan-Stabilo Schwanhausser GmbH & Co.: *See*—
Hofmann, Hans J., 4,640,636, Cl. 401-96.000.

Schwartz, Anne L.: *See*—
Lenox, Ronald S.; Schwartz, Anne L.; and Hoyle, Charles E., 4,640,885, Cl. 430-197.000.
Schwarz, Otto: *See*—
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.
Schweitzer, Edmund O., Jr. Test point mounted voltage monitoring system. 4,641,220, Cl. 361-187.000.
Schwing, Gregory W.: *See*—
Chen, Chi-wan; and Schwing, Gregory W., 4,640,704, Cl. 71-92.000.
Scientific Atlanta, Inc.: *See*—
Mobley, Joseph G., II, 4,641,181, Cl. 358-36.000.
Scientific Component Systems, Inc.: *See*—
McNair, Rhett, 4,641,228, Cl. 362-382.000.
Scott, Paul F.: *See*—
Japenga, Robert J.; and Scott, Paul F., 4,641,269, Cl. 364-473.000.
Scott, Richard A.: *See*—
Fong, John; Wortzman, Mitchell S.; and Scott, Richard A., 4,640,932, Cl. 514-714.000.
Scully-Jones Corp.: *See*—
Rivera, Jeremias C., Jr., 4,640,652, Cl. 409-136.000.
Seaton SSK Engineering Inc.: *See*—
McKibben, Kenneth D.; Gould, Alan P.; Groh, Craig J.; and Wuepper, Thomas E., 4,639,968, Cl. 15-304.000.
SEB S.A.: *See*—
Mayeur, Jacques, 4,641,015, Cl. 219-386.000.
Sedlacek, Robert S.; and Campbell, Neil, to Lab Products, Inc. Animal cage assembly with reusable filter cap. 4,640,228, Cl. 119-15.000.
Sedlmair, Gerhard, to Marker International. Ski binding with screw retaining construction. 4,640,524, Cl. 280-611.000.
Seeley, Gerard: *See*—
Barbee, Steven G.; Devine, Gregory P.; Patrick, William J.; and Seeley, Gerard, 4,640,221, Cl. 118-689.000.
Seifag S.r.l.: *See*—
Marocco, Giuseppe, 4,640,850, Cl. 428-15.000.
Seiferth, Oscar E., to James River Corporation. Food receptacle for microwave cooking. 4,641,005, Cl. 219-10.55E.
Seiko Epson Kabushiki Kaisha: *See*—
Shinohara, Toshihide, 4,640,593, Cl. 351-169.000.
Seiko Instruments & Electronics Ltd.: *See*—
Sasaki, Issei, 4,640,615, Cl. 356-130.000.
Seitz, Paul W.; Lewis, Maurice W.; and Lakes, Stephen D., to NCR Corporation. Protective barrier and method of providing same for thermosensitive sheet. 4,641,159, Cl. 346-200.000.
Seki, Hiroshi; and Kataishi, Ryuichiro. Composite fire sensor. 4,640,628, Cl. 374-141.000.
Sekine, Noboru: *See*—
Nishimura, Sadanori; and Sekine, Noboru, 4,640,393, Cl. 192-0.052.
Seko, Nachio: *See*—
Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, 4,640,608, Cl. 355-15.000.
Selim, Harold N., to IFR, Inc. Wideband, microwave regenerative divider with varactor tuning. 4,641,101, Cl. 328-25.000.
Semedard, Jean-Claude; Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; and Vallee, Gerard, to Stein Industrie. Device for supporting pipes having a low thickness. 4,640,480, Cl. 248-62.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,640,845, Cl. 427-38.000.
Semiconductor Research Foundation: *See*—
Nishizawa, Jun-chi, 4,641,167, Cl. 357-30.000.
Semmler, Jurgen, to Sigri GmbH. Cooled furnace head for heavy-current resistance furnaces. 4,641,321, Cl. 373-120.000.
Senoh, Hideaki: *See*—
Kagota, Nobuhiro; and Senoh, Hideaki, 4,640,714, Cl. 106-21.000.
Sentman, Robert C.: *See*—
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., 4,640,976, Cl. 528-336.000.
Serafini, Angelo: *See*—
Wells, Thomas J.; and Serafini, Angelo, 4,639,957, Cl. 5-248.000.
Setaka, Yousuke: *See*—
Nagata, Masami; Yanase, Sumio; and Setaka, Yousuke, 4,641,066, Cl. 318-254.000.
Setliff, Harold: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.
Seto, Takashi: *See*—
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.
Sevastakis, Gus. Continuous casting apparatus. 4,640,337, Cl. 164-443.000.
SGS Microelectronica SpA: *See*—
Bertotti, Franco; Ferla, Giuseppe; Musumeci, Salvatore; and Raciti, Salvatore, 4,641,171, Cl. 357-46.000.
Shah, Dhirajlal C.: *See*—
Bhat, Deepak G.; Shah, Dhirajlal C.; Kyle, John R.; and Woerner, Paul F., 4,640,693, Cl. 51-295.000.
Shakun, Wallace, to Omnimax Energy Corporation. Thermoelectric generator using variable geometry with support pedestals of dissimilar materials than the basic thermoelectric semi-conductor elements. 4,640,977, Cl. 136-211.000.
Shallenberger, John M.; and Ferlan, Stephen J., to Westinghouse Electric Corp. Locking tube removal and replacement tool and method in a reconstitutable fuel assembly. 4,639,998, Cl. 29-426.500.
Shamie, Louis. Mattress support for crib. 4,639,956, Cl. 5-93.00R.
Shan, Tiejun J.; and Kailath, Thomas, to Leland Stanford Junior University, The Board of Trustees of the. Adaptive signal processing array with suppession of coherent and non-coherent interferring signals. 4,641,259, Cl. 364-724.000.
Sharon, Harold M., to United Technologies Corporation. Process for producing a new edge on an airfoil blade particularly the fan blade for a gas turbine engine. 4,639,991, Cl. 29-156.80B.
Sharp, Celia M.: *See*—
Petelin, Andrei N.; Sharp, Celia M.; Ury, Michael G.; and Wooden, Gene R., 4,641,033, Cl. 250-492.100.
Sharp Kabushiki Kaisha: *See*—
Aiba, Masahiko, 4,641,219, Cl. 361-153.000.
Inamoto, Kiyoshi, 4,640,606, Cl. 355-14.0TR.
Komaki, Shigeki, 4,640,994, Cl. 200-5.00A.
Mizoguchi, Saburo, 4,640,804, Cl. 261-81.000.
Okibayashi, Katsushi; Itoh, Masataka; and Katoh, Shohichi, 4,641,359, Cl. 382-68.000.
Sato, Ryoichi; and Mimoto, Toshio, 4,641,081, Cl. 323-313.000.
Sharpe, Robert: *See*—
Hayes, Michael E.; Hood, Craig C.; Miller, Ronald E.; and Sharpe, Robert, 4,640,719, Cl. 134-40.000.
Sharrah, Raymond L.: *See*—
Penney, C. Bradford; and Sharrah, Raymond L., 4,640,258, Cl. 124-24.00R.
Shaw Industries Ltd.: *See*—
Patell, Farrokh A.; and McConkey, Stephen E., 4,640,312, Cl. 138-109.000.
Shaw, Stephen K.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,640,162, Cl. 83-152.000.
Shell Oil Company: *See*—
Afghan, Madjid; and Sponselee, Josephus G., 4,640,807, Cl. 264-13.000.
Bannon, Robert P.; and Marple, Stanley, 4,640,743, Cl. 203-87.000.
Drent, Eit, 4,640,802, Cl. 260-410.90R.
Grimsby, F. Norman, 4,640,754, Cl. 204-182.400.
Hamilton, David M., Jr., 4,640,764, Cl. 208-110.000.
Hughes, Victor B., 4,640,781, Cl. 210-520.000.
Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,640,766, Cl. 208-111.000.
Schmeal, W. R.; Singhal, S. N.; and Lo, K. H., 4,640,853, Cl. 428-35.000.
Simpson, Wayne F.; Ayers, Ray R.; and Patterson, Robert W., 4,640,645, Cl. 405-63.000.
Vanmeurs, Peter; Waxman, Monroe H.; and Vinegar, Harold J., 4,640,352, Cl. 166-245.000.
Shely, William W.; and Wells, Peter M., to All States Inc. Strain relief grommet. 4,640,479, Cl. 248-56.000.
Sheng, Hwai-Ping; Garza, Cutberto; Winter, Dean C.; and Deskins, William G., to Baylor College of Medicine. Method and apparatus for acoustically measuring the volume of an object. 4,640,130, Cl. 73-579.000.
Shepard, Joseph F.: *See*—
Ogura, Seiki; Riseman, Jacob; Rovedo, Nivo; and Shepard, Joseph F., 4,641,170, Cl. 357-35.000.
Shepherd, Robin G.: *See*—
White, Alan C.; Shepherd, Robin G.; and Langham, Barry J., 4,640,924, Cl. 514-291.000.
Sherwin, Gary W., to Westinghouse Electric Corp. Shielded, self-preparing electrode suitable for electroencephalographic mapping. 4,640,290, Cl. 128-642.000.
Shiau, Jgi J. Inherently effectively damped coiled spring. 4,640,500, Cl. 267-168.000.
Shibahata, Yasuji; Tsubota, Yasumasa; and Uno, Takaaki, to Nissan Motor Co., Ltd. Vehicle steering control system. 4,640,379, Cl. 180-140.000.
Shibata, Junichi; and Kojima, Hiroshi, to Pioneer Ansafone Manufacturing Corporation. Microwave filter. 4,641,116, Cl. 333-204.000.
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki, to Toyota Shatai Kabushiki Kaisha. Moving coil type linear motor. 4,641,065, Cl. 318-135.000.
Shibuya Kogyo Co. Ltd.: *See*—
Sawa, Shigeki; and Ueda, Hiroshi, 4,640,283, Cl. 128-395.000.
Shidei, Ritsuko: *See*—
Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, 4,640,971, Cl. 528-129.000.
Shigemasa, Takashi; and Ichikawa, Yoshinori, to Kabushiki Kaisha Toshiba. Process control apparatus with process dependent switching between process control modes. 4,641,235, Cl. 364-149.000.
Shijima, Kouichi: *See*—
Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, 4,641,215, Cl. 360-35.100.

Shimada, Junichi: *See*—
Mochida, Kenichi; Ogasa, Takehiro; Shimada, Junichi; Hirata, Tadashi; Sato, Kiyoshi; and Okachi, Ryo, 4,640,919, Cl. 514-241.000.

Shimada, Yutaka; Hatanai, Takashi; Mukasa, Koichi; and Nakashima, Keishi, to Alps Electric Co., Ltd. Magnetic head. 4,641,213, Cl. 360-125.000.

Shimaoka, Shoei: *See*—
Inoue, Fumio; Eto, Masahiro; Shimaoka, Shoei; and Sakai, Noboru, 4,641,195, Cl. 358-242.000.

Shimizu, Hiroshi, to Yasunaga Engineering Kabushiki Kaisha. Device for feeding work to machine tool. 4,640,259, Cl. 125-16.00R.

Shimizu, Kenichi: *See*—
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.

Shimizu, Kimihiro; Nakahara, Tsuguji; Kinoshita, Taketoshi; Takatsuka, Jun; and Igarashi, Michiko, to Nippon Chemiphar Company, Ltd. Plasminogen activator derivatives. 4,640,835, Cl. 424-94.000.

Shimoni, Yair: *See*—
Fenster, Paul; Shimoni, Yair; Nissenson, Bilha; and Alperin, Noam, 4,641,352, Cl. 382-6.000.

Shimotori, Kazuhiro; Fujishima, Kazuyasu; Ozaki, Hideyuki; and Miyatake, Hideshi, to Mitsubishi Denki Kabushiki Kaisha. Auxiliary decoder for semiconductor memory device. 4,641,286, Cl. 365-230.000.

Shingaki, Seiichi: *See*—
Ohmi, Shigeaki; Shingaki, Seiichi; Sakai, Hiroyuki; and Asahara, Yoshiyuki, 4,640,699, Cl. 65-3.150.

Shinohara, Toshihide, to Seiko Epson Kabushiki Kaisha. Progressive multifocal ophthalmic lenses. 4,640,593, Cl. 351-169.000.

Shiraishi, Hajime, to Kabushiki Kaisha Toshiba. Clock generator with reset and initialization circuitry. 4,641,044, Cl. 307-269.000.

Shiraishi, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Bidirectional power switch with optimized emitter spacing near control electrode. 4,641,175, Cl. 357-39.000.

Shirakawa, Hiromu: *See*—
Motoyama, Shimesu; Gotou, Masakazu; Shirakawa, Hiromu; and Makino, Takamoto, 4,640,218, Cl. 118-19.000.

Shirasawa, Katsuhiko: *See*—
Koiwai, Sakae; Asaoka, Keizo; Shirasawa, Katsuhiko; Watanabe, Hiroyuki; and Honda, Junichi, 4,640,001, Cl. 29-572.000.

Shirashoji, Hisashi: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 4,640,329, Cl. 152-209.00R.

Shoemaker, John R., to AMP Incorporated. Surface mounting means for printed circuit board. 4,640,562, Cl. 339-17.00F.

Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Image reproducing apparatus with variable AC bias. 4,641,200, Cl. 358-296.000.

Shojima, Hiroshi: *See*—
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.

Shomura, Eiichi: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, 4,640,210, Cl. 112-456.000.

Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,640,521, Cl. 280-47.340.

Short, Jimmie N., to Ralph J. Stolle Company. Method for charging electrical storage batteries. 4,641,078, Cl. 320-21.000.

Showa Highpolymer Co. Ltd.: *See*—
Hanyuda, Toshiaki, 4,640,937, Cl. 522-31.000.

Shukla, Dipak P.; Sinclair, Keith; and Smith, Kevin A., to Tate & Lyle Public Limited Company. Sugar process. 4,640,717, Cl. 127-58.000.

Shure Manufacturing Corporation: *See*—
Richardson, Daniel E., 4,640,200, Cl. 109-19.000.

Shutterly, Harold B., to Westinghouse Electric Corp. Multi-star fiber optic network. 4,641,371, Cl. 455-601.000.

Shutterly, Harold B., to Westinghouse Electric Corp. T-connection fiber-optic repeater. 4,641,373, Cl. 455-601.000.

Sibalis, Dan, to Drug Delivery Systems Inc. Transdermal drug applicator and electrodes therefor. 4,640,689, Cl. 604-20.000.

Sie, Swan T.: *See*—
Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,640,766, Cl. 208-111.000.

Siemens Aktiengesellschaft: *See*—
Auinger, Herbert, 4,641,051, Cl. 310-61.000.
Dziggel, Klaus-Peter, 4,641,245, Cl. 364-478.000.
Fritz, Harald, 4,640,139, Cl. 73-862.040.
Hahn, Alfred, 4,641,335, Cl. 378-153.000.
Hartkopf, Hans O.; and Zillmer, Adalbert, 4,641,243, Cl. 364-436.000.
Keprda, Jaroslav, 4,641,004, Cl. 200-340.000.
Neppl, Franz; Schwabe, Ulrich; and Hieber, Konrad, 4,640,844, Cl. 427-38.000.
Schmalzl, Dieter, 4,640,979, Cl. 174-35.0GC.
Schmid, Ralf; Otto, Johann; Bernklau, Daniela; and Knapek, Erwin, 4,640,626, Cl. 374-57.000.
Tihanyi, Jeno , 4,641,163, Cl. 357-23.400.
Vogl, Herbert, 4,641,303, Cl. 370-84.000.
Wilhelm, Wilhelm, 4,641,283, Cl. 365-190.000.

Sievers, Ricky R.: *See*—
Nesbitt, Richard L.; and Sievers, Ricky R., 4,640,045, Cl. 47-66.000.

Sigler, Perry J. Explosive rodent trap. 4,640,043, Cl. 43-84.000.

Signetics Corporation: *See*—
Becker, Scott T.; Bergman, Michael J.; and Lee, Shueh-Mien, 4,641,046, Cl. 307-448.000.

Sigri GmbH: *See*—
Semmler, Jurgen, 4,641,321, Cl. 373-120.000.

Silva, Lawrence H.: *See*—
Lawrence, Ventura J.; Metcalf, Charles G.; and Silva, Lawrence H., 4,640,367, Cl. 172-225.000.

Simmons, James A., to Bio-Dynamics Research & Development Corporation. Apparatus and method for analyzing acoustical signals. 4,640,134, Cl. 73-648.000.

Simmons, Robert L., Sr.; and Wyant, Clifton M., to Ametek, Inc. Phased array Doppler sonar transducer. 4,641,291, Cl. 367-157.000.

Simone, Dominic; and Brauer, Melvin, to CasChem, Inc. Graft polyols. 4,640,801, Cl. 260-407.000.

Simonin, Marcel; Garbe, Bernard; and Carron, Alain, to Compagnie Generale d'Automatisme CGA-HBS. Two-way pedestrian access control system. 4,640,047, Cl. 49-47.000.

Simons, Petrus A. M. R.; and Bouts, Wilhelmus J., to Oce-Nederland B.V. Copying process and electrophotographic element utilizing a photoconductive pigment dispersed in an improved polymeric binder. 4,640,879, Cl. 430-96.000.

Simpson, Wayne F.; Ayers, Ray R.; and Patterson, Robert W., to Shell Oil Company. Containment boom system. 4,640,645, Cl. 405-63.000.

Sinclair, Keith: *See*—
Shukla, Dipak P.; Sinclair, Keith; and Smith, Kevin A., 4,640,717, Cl. 127-58.000.

Singhal, S. N.: *See*—
Schmeal, W. R.; Singhal, S. N.; and Lo, K. H., 4,640,853, Cl. 428-35.000.

Siwinski, Paul P.: *See*—
Dola, Frank P.; Siwinski, Paul P.; and Zwieg, Grover A., 4,640,569, Cl. 339-143.00R.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Hetterich, Hermann; and Horling, Peter, 4,640,632, Cl. 384-537.000.

Skostins, Olgerts, to Dow Corning Corporation. Method of manufacture of fiber reinforced silicone elastomer. 4,640,951, Cl. 524-266.000.

Skudrna, Anthony J.: *See*—
Fedder, Stephen C.; and Skudrna, Anthony J., 4,641,152, Cl. 346-137.000.

Skvaril, Joseph. Self-containing package system for storage and transportation of pre-fabricated portions of a building structure and the assembly thereof. 4,640,412, Cl. 206-321.000.

Slade, Luman C. Safety lock apparatus for an electrical plug. 4,640,107, Cl. 70-57.000.

Smith, Dale C., to Dolly Varden Fishing Lures. Cyclic fishing lure containing a slidable fishhook assembly. 4,640,040, Cl. 43-42.000.

Smith, Edward H.: *See*—
Draper, Robert; and Smith, Edward H., 4,640,233, Cl. 122-488.000.

Smith, Kenneth L., to Adams-Russell Company, Inc. Shielded radio frequency transmission cable having propagation constant enhancing means. 4,641,110, Cl. 333-12.000.

Smith, Kevin A.: *See*—
Shukla, Dipak P.; Sinclair, Keith; and Smith, Kevin A., 4,640,717, Cl. 127-58.000.

Smith Kline & French Laboratories Limited: *See*—
Sach, George S., 4,640,926, Cl. 514-333.000.

Smith, Kobert R., II, to Micro Storage Ltd. Disc type information storage and retrieval system. 4,641,209, Cl. 360-86.000.

Smith, Lloyd B., to United Coal Company. Apparatus for extracting water from solid fines or the like. 4,640,770, Cl. 210-144.000.

Smith, Ward C.: *See*—
Carroll, Richard J.; Luderer, Albert A.; Smith, Ward C.; and Zine, Anthony R., Jr., 4,640,785, Cl. 210-782.000.

Smith, William H.; and Vinson, Edward F., to Halliburton Company. Thermally responsive aqueous silicate mixtures and use thereof. 4,640,361, Cl. 166-288.000.

Smolensky, Leo A.: *See*—
Holmes, Myron L.; and Smolensky, Leo A., 4,640,201, Cl. 110-245.000.

Smushkovich, Yosif. Video driver level shifter. 4,641,063, Cl. 315-383.000.

Snyder, David A.: *See*—
Cooper, Frank W., Jr.; Howard, Bruce A.; and Snyder, David A., 4,639,994, Cl. 29-402.010.

Sobieralski, Theodore J., to Dow Chemical Company, The. Impure zinc powder, preparation thereof, and use as a selective reductant for pentachloropyridine. 4,640,712, Cl. 75-251.000.

Socared S.A.: *See*—
Brandt, Bertil, 4,640,212, Cl. 114-230.000.

Societe de Exploitation des Procedes Marechal: *See*—
Magourou, Yves L., 4,640,568, Cl. 339-103.00R.

Societe de Traitement Automatique—Controle et Etancheite "T R A C E" : *See*—
Heraud, Roger A.; and Amiel, Jacques, 4,640,122, Cl. 73-49.200.

Societe Miniere et Metallurgique de Penerroya: *See*—
Beutier, Didier; and Predali, Jean-Jacques, 4,640,710, Cl. 75-108.000.

Societe Nationale d'Etude et de Construction de Meteur d'Aviation S.N.E.C.M.A.: *See*—
Batt, Andre; and Delabie, Jacques, J. A., 4,640,980, Cl. 174-36.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation - S.N.E.C.M.A.: *See*—
Morbioli, Rene J.; and Ney, Jean C., 4,640,768, Cl. 209-37.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Lechon, Alain; and Viard, Alain, 4,640,096, Cl. 60-547.100.
Sodergard, Bengt, to International Standard Electric Corporation. Centrifugal pump. 4,640,666, Cl. 415-121.00B.
Soderquist, Mark E.; Muthyala, Ramaiah; Larson, William A.; and Doty, Peter A., to Dow Chemical Company, The. Phosphonium salt-containing corrosion inhibitors for high density brines. 4,640,786, Cl. 252-8.551.
Somasundaram, Hariharan: *See—*
Fish, Aaron M.; Mazoff, Stanley S.; D'Intino, Adamo M.; and Somasundaram, Hariharan, 4,640,110, Cl. 70-269.000.
Sone, Tomoshi: *See—*
Yotsutani, Akio; Makino, Masayuki; Saegusa, Noboru; and Sone, Tomoshi, 4,640,986, Cl. 379-60.000.
Sony Corporation: *See—*
Furukawa, Shunsuke; Suzuki, Tadao; and Monen, Marinus J. B. M., 4,641,295, Cl. 369-32.000.
Hayashi, Kazuhiko; Ochiai, Yoshitaka; Hayakawa, Masatoshi; Matsuda, Hideki; Ishikawa, Wataru; Iwasaki, You; and Aso, Koichi, 4,640,871, Cl. 428-611.000.
Inazawa, Yoshizumi; Takahashi, Toshihiko; Tani, Toshiyuki; and Satomura, Shigeyuki, 4,641,208, Cl. 360-72.200.
Komuro, Toshio, 4,641,293, Cl. 369-6.000.
Musha, Kazuhiko; Tago, Kohichi; and Kato, Hidetoshi, 4,641,196, Cl. 358-246.000.
Nakamura, Yoshiyuki; Kato, Tetsuro; and Ebihara, Norio, 4,641,202, Cl. 358-313.000.
Nakano, Kenji; and Moriwaki, Hisayoshi, 4,641,309, Cl. 371-31.000.
Ohyama, Masao, 4,641,210, Cl. 360-96.500.
Sato, Noboru, 4,640,755, Cl. 204-192.200.
Sumiyoshi, Hiroji; and Arae, Teiji, 4,641,059, Cl. 313-477.00R.
Takei, Shinzo; Yokoyama, Junji; and Takagi, Makoto, 4,640,700, Cl. 65-59.220.
Sorensen, Gerald R.: *See—*
Hornblad, Richard P.; and Sorensen, Gerald R., 4,640,029, Cl. 40-5.000.
Sorenson, Richard W., to Carlingswitch, Inc. Push button switch with compound contact lever action. 4,640,998, Cl. 200-67.00A.
Sortwell, Edwin T., to Diatec Polymers. Dispersion of dry polymers into water. 4,640,622, Cl. 366-76.000.
Souhrada, Frank: *See—*
Woods, H. John; and Souhrada, Frank, 4,640,762, Cl. 208-56.000.
Soula, Gerard: *See—*
Cavezzan, Jacques; and Soula, Gerard, 4,640,939, Cl. 522-99.000.
Southern Steel Company: *See—*
Young, Quentin H., 4,640,108, Cl. 70-129.000.
Spahn, James G.: *See—*
Quillen, Jeffrey B.; and Spahn, James G., 4,639,960, Cl. 5-455.000.
Spears, William D.: *See—*
Grierson, Jeffrey G.; Jones, Carol A.; and Spears, William D., 4,640,818, Cl. 422-15.000.
Spectrolyte, Inc.: *See—*
Reich, William N., 4,640,589, Cl. 350-523.000.
Spectrum CVD, Inc.: *See—*
Bunch, Matthew L.; Price, J. B.; and Stitz, Robert W., 4,640,224, Cl. 118-725.000.
Speed, Philip, to Hoskins Limited. Maternity bed. 4,639,954, Cl. 5-63.000.
Spellman, Francis T., Jr., to Hy-Lite Mfg. Co., Inc. Fork lift attachment for tractor. 4,640,662, Cl. 414-642.000.
Speranza, Daniel R., to AMF Incorporated. Bowling ball return mechanism. 4,640,511, Cl. 273-49.000.
Sperry Corporation: *See—*
Zweifel, Terry L.; and Miller, Harry, 4,641,268, Cl. 364-440.000.
Spitzenberger, Kurt: *See—*
Modic, Fedor; Leibfried, Wolfgang; Nitsch, Manfred; Spitzenberger, Kurt; and Zimmermann, Herbert, 4,640,739, Cl. 156-659.100.
Splett, Erich: *See—*
Bittner, Friedrich; Hinrichs, Walter; Hovestadt, Herbert; Lange, Ludwig; and Splett, Erich, 4,640,832, Cl. 423-562.000.
Sponselee, Josephus G.: *See—*
Afghan, Madjid; and Sponselee, Josephus G., 4,640,807, Cl. 264-13.000.
Stacey, Ralph E., to Green Bay Packaging Inc. One-piece folded box construction having a hinged wall. 4,640,456, Cl. 229-122.000.
Stafford, Trevor G., to British Gas Corporation. Apparatus for fusion joining of thermoplastic pipes. 4,640,732, Cl. 156-358.000.
Stalder, Herbert; Baumgartner, Josef; and Wurmli, Arthur, to Rieter Machine Works. Method and device for spinning a yarn in accordance with the open end-friction spinning principle. 4,640,089, Cl. 57-401.000.
Standard Oil Company, The: *See—*
Curatolo, Benedict S.; Sentman, Robert C.; and Coffey, Gerald P., 4,640,976, Cl. 528-336.000.
Standard Oil Company (Indiana): *See—*
Brooks, Gary T., 4,640,944, Cl. 523-205.000.
Howe, Arthur T., 4,640,744, Cl. 204-1.00R.
Kreider, David R.; McCullum, Albert; Rose, Philip M.; and Lin, Chi-Hung, 4,640,963, Cl. 526-67.000.
Stanley Electric Co., Ltd.: *See—*
Kudo, Sinji, 4,641,230, Cl. 363-56.000.
Stanley Jigs, Inc.: *See—*
Stanley, Lonnie D., 4,640,041, Cl. 43-42.130.
Stanley, Lonnie D., to Stanley Jigs, Inc. Spinner bait with arms of different diameter. 4,640,041, Cl. 43-42.130.
Stanley, Robert K. Interlining of pipelines for transporting sewage, water, slurries, liquid and gaseous hydrocarbons, and the like. 4,640,313, Cl. 138-141.000.
Staodynamics, Inc.: *See—*
Thomson, Thomas H., 4,640,286, Cl. 128-421.000.
Staroselsky, Naum; and Mirsky, Saul, to Compressor Controls Corp. Method for controlling a multicompressor station. 4,640,665, Cl. 415-1.000.
Staton, Richard D.: *See—*
Lamond, Lee T.; and Staton, Richard D., 4,640,484, Cl. 248-407.000.
STC PLC: *See—*
Kelly, Patrick S.; Oswald, Thomas; Jeal, Alan J.; Hill, Stephen E.; and Murphy, Robert, 4,641,372, Cl. 455-601.000.
Stearns, R. Dewey, III. Water driven shower massager. 4,640,462, Cl. 239-383.000.
Steenhof, Frits A.: *See—*
Martens, Theodorus G. J. A.; Steenhof, Frits A.; and Kalfs, Johannes J. W., 4,641,310, Cl. 371-38.000.
Steer, Peter L., to Craig Medical Products, Limited. Tap or valve. 4,640,494, Cl. 251-354.000.
Stein Industrie: *See—*
Semedard, Jean-Claude; Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; and Vallee, Gerard, 4,640,480, Cl. 248-62.000.
Stein, Robert G.: *See—*
Faubl, Hermann; and Stein, Robert G., 4,640,910, Cl. 514-29.000.
Steinbiss, Eberhard; Herchenbach, Horst; and Wolter, Albrecht, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the removal of harmful and waste materials by combustion. 4,640,681, Cl. 432-14.000.
Steiner, Paul; and Stocker, Bruno, to Kollektivgesellschaft Eberhard, Steiner & Dr. Stocker. Combination hole punch and stapler. 4,640,451, Cl. 227-76.000.
Steiner, William M.: *See—*
Sawyer, Steven D.; Hill, William D.; Wilson, Patricia A.; and Steiner, William M., 4,640,812, Cl. 376-245.000.
Stenmark, Lars. Infrared-sensitive detector consisting of Peltier element. 4,641,134, Cl. 340-567.000.
Stern, Howard S.: *See—*
Greene, Franklin R.; Stern, Howard S.; and Waye, Jerome D., 4,640,273, Cl. 128-136.000.
Sternberg, Stanley R., to Machine Vision International Corporation. Apparatus and method for implementing dilation and erosion transformations in grayscale image processing. 4,641,356, Cl. 382-49.000.
Sterzer, Fred, to RCA Corporation. Microwave hyperthermia with dielectric lens focusing. 4,640,280, Cl. 128-804.000.
Stewart, Ronald D.: *See—*
Donecker, S. Bruce; Stewart, Ronald D.; and Frederick, Wayne L., 4,641,085, Cl. 324-77.00R.
Stipsits, Gunter: *See—*
Leuker, Wilhelm; Stipsits, Gunter; and Thiel, Bernhard, 4,640,121, Cl. 73-40.50A.
Stitz, Robert W.: *See—*
Bunch, Matthew L.; Price, J. B.; and Stitz, Robert W., 4,640,224, Cl. 118-725.000.
Stocker, Bruno: *See—*
Steiner, Paul; and Stocker, Bruno, 4,640,451, Cl. 227-76.000.
Stojanovski, Stojan. Tool holder with plurality of cutting inserts. 4,640,159, Cl. 82-36.00A.
Stol, Israel; and Appleman, Robert H., to Westinghouse Electric Corp. Corrosion resistant steam generator and method of making same. 4,639,992, Cl. 29-157.00R.
Stoltman, Donald D., to General Motors Corporation. Failsafe drive-by-wire engine controller. 4,640,248, Cl. 423-399.000.
Stone, Catharine E.: *See—*
Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., 4,640,837, Cl. 426-94.000.
Storandt, Ralf: *See—*
Maier, Helmut; Storandt, Ralf; Guenther, Heinz, deceased; Guenther, Renate, legal representative; and Guenther, Sabine, legal representative, 4,640,051, Cl. 49-348.000.
Stork PMT B.V.: *See—*
van der Eerden, Henricus F. J. M., 4,639,973, Cl. 17-11.000.
van der Eerden, Henricus F. J. M., 4,639,975, Cl. 17-11.000.
Stottlemyer, William O., to ITT Corporation. Variable bandwidth handsfree telephone using switched capacitor filtering. 4,641,339, Cl. 379-391.000.
Strata Bit Corporation: *See—*
Dennis, Mahlon D., 4,640,374, Cl. 175-393.000.
Strate, Edward A., to United States of America, Air Force. Electrical cone connector. 4,640,570, Cl. 339-182.00R.
Straznickas, Donald A.: *See—*
Glennon, Timothy F.; Olson, Raymond N.; and Straznickas, Donald A., 4,641,080, Cl. 322-49.000.
Streamlight, Inc.: *See—*
Penney, C. Bradford; and Sharrah, Raymond L., 4,640,258, Cl. 124-24.00R.
Street, Graham S. B., to Brightad Limited. Method and apparatus for producing stereoscopic images. 4,641,178, Cl. 358-3.000.
Streets, Roger L.; Rabito, Thomas G.; and Peresie, David N., to Ashland Oil, Inc. Method of adhering roofing materials. 4,640,730, Cl. 156-334.000.
Strength, Tech, Inc.: *See—*
Polson, Gary R., 4,639,979, Cl. 24-270.000.

Streu, Rick D.: *See*—
Groenhof, Eugene D.; Romenesko, David J.; and Streu, Rick D., 4,640,792, Cl. 252-78.300.

Stricker, David K.: *See*—
Dobberpuhl, Dale R.; and Stricker, David K., 4,640,378, Cl. 180-53.100.

Strohbeen, David T.: *See*—
Ales, Thomas M.; Strohbeen, David T.; Damico, Joyce A.; Van Gompel, Paul T.; and Abel, Kent W., 4,639,949, Cl. 2-400.000.

Strong, David, to United States of America, Air Force. Inspection workstation data entry method. 4,641,250, Cl. 364-507.000.

Strunk, Richard J.; and Moore, Richard C., to Uniroyal Chemical Company, Inc. Substituted oxime carbamates. 4,640,927, Cl. 514-342.000.

Struve, Walter S.: *See*—
Holland, George E.; Struve, Walter S.; and Homer, John F., 4,641,343, Cl. 381-48.000.

Stuck, Matthew A., to Modern Mfg. Co. Inc. Device for packaging plants. 4,640,079, Cl. 53-390.000.

Stump, Lee E., to Timesavers, Inc. Vertically self-centering feed assembly. 4,640,056, Cl. 51-138.000.

Sturdy, H. David, to Sturdy Truck Equipment, Incorporated. Road and engine speed governor with power demand control. 4,640,246, Cl. 123-350.000.

Sturdy Truck Equipment, Incorporated: *See*—
Sturdy, H. David, 4,640,246, Cl. 123-350.000.

Sturm, Gerd-Jochen; and Wehking, Wolfgang, to Prameta Prazisionsmetall- und Kunststofferzeugnisse G. Baumann & Co. Tourniquet. 4,640,281, Cl. 128-327.000.

Stusack, Hans; and Schulz, Peter, to Franz Sachs & Co. KG. Tape dispenser. 4,640,167, Cl. 83-649.000.

Subrahmanian, K. P.: *See*—
Kilbane, George J.; and Subrahmanian, K. P., 4,640,978, Cl. 174-23.00R.

Substrate Systems, Inc.: *See*—
Runyon, Robert C., 4,640,651, Cl. 409-132.000.

Suchowerskyj, Wadym: *See*—
Mattes, Bernhard; Mausner, Eberhard; and Suchowerskyj, Wadym, 4,641,041, Cl. 307-10.00R.

Suddeutsche Kuhlerfabrik Julius Fr., Behr GmbH & Co. KG: *See*—
Martin, Hans, 4,640,235, Cl. 123-41.030.

Suddeutsche Zucker-Aktiengesellschaft: *See*—
Munir, Mohammad, 4,640,894, Cl. 435-100.000.

Sudholter, Ernst J. R.: *See*—
Post, Martin F. M.; Sie, Swan T.; and Sudholter, Ernst J. R., 4,640,766, Cl. 208-111.000.

Suematsu, Toshio: *See*—
Harada, Osamu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, 4,640,251, Cl. 123-425.000.

Suematu, Yoshiyuki: *See*—
Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, 4,640,971, Cl. 528-129.000.

Suga, Masaaki: *See*—
Murasugi, Takashi; Suga, Masaaki; and Niikura, Yasuhiro, 4,640,395, Cl. 192-3.310.

Sugai, Shinzo; Yamane, Shigemi; and Kuze, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Lead frame and method for manufacturing the same. 4,640,723, Cl. 148-411.000.

Sugawara, Toru: *See*—
Ito, Yasuyuki; and Sugawara, Toru, 4,641,031, Cl. 250-423.00R.

Sugimori, Shigeru: *See*—
Ogawa, Tetsuya; Kitano, Kisei; Goto, Yasuyuki; Fukui, Masahiro; and Sugimori, Shigeru, 4,640,795, Cl. 252-299.500.
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,640,796, Cl. 252-299.610.

Sugiura, Kazuo: *See*—
Watanabe, Junichiro; Funahashi, Yuichi; Sugiura, Kazuo; and Matsumoto, Hironori, 4,640,968, Cl. 528-32.000.

Sugiura, Kenji: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.

Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Recording and reproducing system for recording both analogue and digital information on and from a disc. 4,641,204, Cl. 358-341.000.

Sullivan, William B., Jr., to Raytheon Company. Radio frequency receiver. 4,641,368, Cl. 455-239.000.

Sulzer Brothers Limited: *See*—
Gacsay, Lorant, 4,640,315, Cl. 139-1.00C.
Hintsch, Otto; and Ernst, Hansperer, 4,640,318, Cl. 139-439.000.
Lattion, Andre , 4,640,088, Cl. 57-263.000.
Trepp, Christian, 4,640,667, Cl. 417-52.000.

Sum, Phaik E.: *See*—
Wissner, Allan; Schaub, Robert E.; and Sum, Phaik E., 4,640,913, Cl. 514-77.000.

Sumitomo Chemical Company, Ltd.: *See*—
Nagano, Eiki; Haga, Toru; Sato, Ryo; and Morita, Kouichi, 4,640,707, Cl. 71-96.000.

Sumitomo Chemicial Company, Limited: *See*—
Saito, Teruo; Asai, Kuniaki; Suzuki, Yasuro; and Kagiya, Kei, 4,640,961, Cl. 525-444.000.

Sumitomo Electric Industries, Ltd.: *See*—
Tsuno, Koichi, 4,640,577, Cl. 350-96.250.

Sumitomo Metal Industries, Ltd.: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.
Kajimura, Haruhiko; Nagano, Hiroo; and Miura, Minoru, 4,640,817, Cl. 420-50.000.
Sakamoto, Takahide; Hiroshima, Tatsuo; Matsubara, Noriyuki; and Miyata, Kenichi, 4,641,092, Cl. 324-227.000.

Sumitomo Metal Mining Co., Ltd.: *See*—
Miyoshi, Akio; and Fukami, Akira, 4,640,436, Cl. 220-359.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 4,640,329, Cl. 152-209.00R.

Sumiyoshi, Hiroji; and Arae, Teiji, to Sony Corporation. Cathode ray tube. 4,641,059, Cl. 313-477.00R.

Sun Coast Plastics, Inc.: *See*—
Dutt, Herbert V., 4,640,435, Cl. 220-307.000.

Sunada, Tomonori: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, 4,640,822, Cl. 422-111.000.

Sunami, Hideo: *See*—
Kimura, Katsutaka; Hori, Ryoichi; Ito, Kiyoo; and Sunami, Hideo, 4,641,279, Cl. 365-149.000.

Sundstrand Corporation: *See*—
Glennon, Timothy F.; Olson, Raymond N.; and Straznickas, Donald A., 4,641,080, Cl. 322-49.000.

Suntory Limited: *See*—
Cho, Hidetsura; Aisaka, Kazuo; and Emon, Mariko, 4,640,922, Cl. 514-256.000.

Sunwell Engineering Company Limited: *See*—
Goldstein, Vladimir, 4,640,100, Cl. 62-197.000.

Supran, Michael K.: *See*—
Assinder, Ivar; Supran, Michael K.; and Thompson, Geoffrey A. K., 4,640,840, Cl. 426-399.000.

Survival Technology, Inc.: *See*—
Dalling, N. Lawrence; and Gordon, Linda A., 4,640,686, Cl. 434-262.000.

Susumu Industrial Co., Ltd.: *See*—
Ozawa, Juichiro, 4,641,113, Cl. 333-161.000.

Sutton, Leroy, to Zenith Electronics Corporation. Standby system for video display. 4,641,191, Cl. 358-168.000.

Suzaki, Masafumi; Mikami, Katsumasa; Nagano, Yousuke; and Kitagishi, Tomoji, to Hitachi, Ltd. Thermal transfer printer. 4,641,149, Cl. 346-76.0PH.

Suzuki, Akiyoshi; and Ina, Hideki, to Canon Kabushiki Kaisha. Apparatus and a method for position detection of an object stepped portion. 4,641,035, Cl. 250-548.000.

Suzuki, Hirosuke, to Junkosha Company Ltd. Printed circuit board. 4,640,866, Cl. 428-422.000.

Suzuki, Kiyoshi: *See*—
Nakagawa, Takeo; and Suzuki, Kiyoshi, 4,640,156, Cl. 82-1.00C.

Suzuki, Mamoru; and Fukui, Shinta, to Tokyo Electric Power Co., Inc., The; and Mitsubishi Denki Kabushiki Kaisha. Method for determining reliability in electric power system. 4,641,248, Cl. 364-492.000.

Suzuki, Masami; Hirota, Tatsuya; and Maeda, Masahiko, to Sanyo Electric Co., Ltd. Clothes dryer. 4,640,022, Cl. 34-48.000.

Suzuki, Nobuhiko. Brush for cleaning clothes. 4,639,965, Cl. 15-104.00A.

Suzuki, Shigeru: *See*—
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.

Suzuki, Tadao: *See*—
Furukawa, Shunsuke; Suzuki, Tadao; and Monen, Marinus J. B. M., 4,641,295, Cl. 369-32.000.

Suzuki, Takao: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.

Suzuki, Takashi, to Canon Kabushiki Kaisha. Range finding device with a spatial low-pass filter. 4,641,022, Cl. 250-204.000.

Suzuki, Yasuo, to Fujitsu Limited. Signal transmission circuit for a storage device. 4,641,284, Cl. 365-210.000.

Suzuki, Yasuro: *See*—
Saito, Teruo; Asai, Kuniaki; Suzuki, Yasuro; and Kagiya, Kei, 4,640,961, Cl. 525-444.000.

Suzumura, Masanaga: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.

Svengren, Anders G.; and Ganrot, Bertil A., to Nestec S.A. Preparation of a rolled pastry product. 4,640,670, Cl. 425-142.000.

Swallow, Nancy A.: *See*—
Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., 4,640,837, Cl. 426-94.000.

Swank, Edgar W., to International Business Machines Corporation. Method for communicating changes made to text form a text processor to a remote host. 4,641,274, Cl. 364-900.000.

Swartzendruber, Ray E.; and Coffman, Keith, to Chore-Time Equipment, Inc. Apparatus for feeding livestock. 4,640,229, Cl. 119-51.110.

Swift, Stephen D.: *See*—
Garman, James A.; and Swift, Stephen D., 4,639,995, Cl. 29-402.080.
Swiss Aluminium Ltd.: *See*—
Heamon, Mark L., 4,640,497, Cl. 266-227.000.
Sylvester, Judith M.; and Kimball, David J., to Dow Corning Corporation. Dispersant composition for magnetic media. 4,640,790, Cl. 252-62.540.
Szatmari, Sandor: *See*—
Schafer, Fritz P.; Szatmari, Sandor; and Bor, Zsolt, 4,641,312, Cl. 372-25.000.
't Hoen, Pieter, to North American Philips Corporation. Bi-plane phased array for ultrasound medical imaging. 4,640,291, Cl. 128-660.000.
Tachikawa Spring Co., Ltd.: *See*—
Sakamoto, Takao, 4,640,488, Cl. 248-588.000.
Tachikawa Spring Co. Ltd: *See*—
Yokota, Masaaki, 4,640,549, Cl. 297-410.000.
Tachita, Ryobun: *See*—
Fukukita, Hiroshi; Tachita, Ryobun; Fukaya, Kuniaki; and Yano, Tsutomu, 4,641,260, Cl. 364-737.000.
Tago, Kohichi: *See*—
Musha, Kazuhiko; Tago, Kohichi; and Kato, Hidetoshi, 4,641,196, Cl. 358-246.000.
Tagoku, Izumi: *See*—
Ohdake, Eishu; Oikawa, Tomohiro; Shimizu, Kenichi; Seto, Takashi; Ishikawa, Masahiro; Suzuki, Shigeru; and Tagoku, Izumi, 4,640,611, Cl. 355-77.000.
Taguchi, Takao: *See*—
Okamura, Shigeru; and Taguchi, Takao, 4,641,034, Cl. 250-492.200.
Taguchi, Yukiyasu: *See*—
Yasukawa, Masao; and Taguchi, Yukiyasu, 4,640,147, Cl. 74-409.000.
Tahim, Raghbir S.: *See*—
Grote, Albert J.; Tahim, Raghbir S.; and Chang, Kai, 4,641,369, Cl. 455-327.000.
Tajima, Osamu; Yamada, Makoto; Hagino, Hideo; and Nishizawa, Nobuyoshi, to Sanyo Electric Co., Ltd. Temperature control system for fuel cell powerplant. 4,640,873, Cl. 429-24.000.
Takada, Masayuki: *See*—
Nagai, Takaatsu; Takada, Masayuki; Sato, Akira; and Imamura, Mineo, 4,641,319, Cl. 373-84.000.
Takagi, Hiroshi: *See*—
Nishimura, Yukuo; Asano, Toshiaki; Mizusawa, Nobutoshi; Kawakami, Eigo; Haruta, Masahiro; Noma, Takashi; Takagi, Hiroshi; Nakazawa, Mitsunobu; and Ozawa, Kunitaka, 4,640,592, Cl. 350-96.320.
Takagi, Makoto: *See*—
Takei, Shinzo; Yokoyama, Junji; and Takagi, Makoto, 4,640,700, Cl. 65-59.220.
Takahashi, Hideaki: *See*—
Kawade, Hideji; Takahashi, Hideaki; Sato, Yoshiyuki; and Urayama, Yuji, 4,640,990, Cl. 379-77.000.
Takahashi, Naotomi: *See*—
Ueno, Kuniki; and Takahashi, Naotomi, 4,640,747, Cl. 204-37.100.
Takahashi, Shinya: *See*—
Katoh, Akira; Ida, Masatoshi; Shijima, Kouichi; Oishi, Makoto; Hashimoto, Akihiko; and Takahashi, Shinya, 4,641,215, Cl. 360-35.100.
Takahashi, Shizuo; and Yamashita, Kiyoshi, to Tokyo Automatic Machinery Works, Ltd. Apparatus for producing bags and packing articles therein. 4,640,083, Cl. 53-551.000.
Takahashi, Toshihiko: *See*—
Inazawa, Yoshizumi; Takahashi, Toshihiko; Tani, Toshiyuki; and Satomura, Shigeyuki, 4,641,208, Cl. 360-72.200.
Takahashi, Yoshio, to Pioneer Electronic Corporation. Body-sensible acoustic device. 4,641,345, Cl. 381-86.000.
Takahata, Daisuke; and Sakai, Yukiyoshi, to Nippon Ceramic Company, Limited. Piezoelectric electro-acoustic transducer. 4,641,054, Cl. 310-324.000.
Takatsuka, Jun: *See*—
Shimizu, Kimihiro; Nakahara, Tsuguji; Kinoshita, Taketoshi; Takatsuka, Jun; and Igarashi, Michiko, 4,640,835, Cl. 424-94.000.
Takeda Chemical Industries, Ltd.: *See*—
Meguro, Kanji; and Nishikawa, Kohei, 4,640,916, Cl. 514-222.000.
Mitsudera, Hiroyuki; Konishi, Kazuo; and Sato, Yasuo, 4,640,929, Cl. 514-436.000.
Nishino, Kenichi; Kobayashi, Atsuo; Higashi, Sachio; Yamamoto, Shinichiro; and Yasuda, Kiyoshi, 4,640,950, Cl. 524-265.000.
Takeda, Hiroshi; Oshima, Noritsugu; Kubo, Tateo; and Sakaguchi, Kenichi, to Toyo Seikan Kaisha, Ltd. Compression molding apparatus. 4,640,673, Cl. 425-297.000.
Takeda, Masaaki, to Matsushita Seiko Co., Ltd. Ultrasonic liquid atomizer with an improved soft start circuit. 4,641,053, Cl. 310-317.000.
Takeda, Yuji: *See*—
Harada, Osamu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, 4,640,251, Cl. 123-425.000.
Takehara, Masahiro: *See*—
Meguro, Kenjiro; Sagawa, Koichiro; Yokota, Hirofumi; and Takehara, Masahiro, 4,640,943, Cl. 523-200.000.
Takei, Shinzo; Yokoyama, Junji; and Takagi, Makoto, to Sony Corporation. Method for attaching a stud pin to a cathode ray tube panel. 4,640,700, Cl. 65-59.220.
Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, to Fujitsu Limited. Semiconductor memory device having stacked capacitor-type memory cells. 4,641,166, Cl. 357-23.600.
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, to Janome Sewing Machine Co, Ltd. Computer controlled sewing machine. 4,640,210, Cl. 112-456.000.
Takesako, Sumiyoshi, to Kabushiki Kaisha Toshiba. Automatic-transfer-transaction processing apparatus. 4,641,239, Cl. 364-408.000.
Takeuchi, Akihiko, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 4,641,158, Cl. 346-160.000.
Takeuchi, Shigeo, to Takeuchi Tekko Kabushiki Kaisha. Kitchen utensil. 4,640,467, Cl. 241-152.00R.
Takeuchi Tekko Kabushiki Kaisha: *See*—
Takeuchi, Shigeo, 4,640,467, Cl. 241-152.00R.
Taki, Yoshihiro; Akado, Hajime; Funae, Keizo; and Inukai, Satoshi, to Nippondenso Co., Ltd. Filter element. 4,640,779, Cl. 210-493.500.
Takiguchi, Eiji; Yuto, Kazuaki; and Oniki, Toru, to Bridgestone Corporation. Pneumatic tire having all-weather running performances. 4,640,952, Cl. 524-296.000.
Takizawa, Morio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Sliding friction member for lens sliding ring. 4,640,579, Cl. 350-255.000.
Takizawa, Shozo: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.
Tamborski, Christ; and Clark, Leland C., Jr., to Adamantech, Inc.; and Children's Hospital Research Foundation. Use of perfluorobromoalkyl ethers as X-ray contrast agents. 4,640,833, Cl. 424-5.000.
Tamura Electric Works Ltd.: *See*—
Kawade, Hideji; Takahashi, Hideaki; Sato, Yoshiyuki; and Urayama, Yuji, 4,640,990, Cl. 379-77.000.
Tamura, Kaoru: *See*—
Ohgoda, Makoto; and Tamura, Kaoru, 4,640,507, Cl. 271-245.000.
Tanaka, Atsuo: *See*—
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, 4,640,808, Cl. 264-46.500.
Tanaka, Hiroshi: *See*—
Asai, Eiichi; Tanaka, Hiroshi; and Higashi, Nobuaki, 4,641,267, Cl. 364-414.000.
Tanaka, Honami: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, 4,640,822, Cl. 422-111.000.
Tanaka, Jouji; Watanabe, Tetunobu; Tanimoto, Yoshiji; and Okumura, Minoru, to Nitsuko Limited; and Nippon Telegraph and Telephone Corporation. Key telephone system with means for operatively connecting another key telephone systems. 4,641,337, Cl. 379-162.000.
Tanaka, Shinya, to Canon Kabushiki Kaisha. Stereoscopic microscope including a rotatable light beam distributing means with a surface having distributing and non-distributing areas. 4,640,588, Cl. 350-516.000.
Tanaka, Shizuo: *See*—
Nakane, Mototaka; and Tanaka, Shizuo, 4,640,400, Cl. 192-70.250.
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,640,526, Cl. 280-707.000.
Tanaka, Yasuhiro, to Murata Manufacturing Co., Ltd. Piezoelectric resonator with notched sides. 4,641,055, Cl. 310-368.000.
Tanaka, Yoshinari: *See*—
Akazawa, Toshiyuki; Tanaka, Yoshinari; and Okaya, Takuji, 4,640,870, Cl. 428-483.000.
Tani, Toshiyuki: *See*—
Inazawa, Yoshizumi; Takahashi, Toshihiko; Tani, Toshiyuki; and Satomura, Shigeyuki, 4,641,208, Cl. 360-72.200.
Taniguchi, Yasutaka: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai, Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.
Tanimoto, Tetsuyuki: *See*—
Yasumoto, Hitoshi; and Tanimoto, Tetsuyuki, 4,640,609, Cl. 355-37.000.
Tanimoto, Yoshiji: *See*—
Tanaka, Jouji; Watanabe, Tetunobu; Tanimoto, Yoshiji; and Okumura, Minoru, 4,641,337, Cl. 379-162.000.
Tanner, Risto; and Purhonen, Hannu. Means for indicating direction and a method of determining a direction. 4,640,016, Cl. 33-356.000.
Tansil, Thomas B.: *See*—
Matthews, Gordon H.; Tansil, Thomas B.; and Fannin, Michael L., 4,640,991, Cl. 379-88.000.
Targa, Giorgio; and Russo, Vitaliano. Rope-making machine. 4,640,087, Cl. 57-58.360.
Tarjan, Peter P.: *See*—
DeCote, Robert, Jr.; and Tarjan, Peter P., 4,640,285, Cl. 128-419.0PT.
Tate & Lyle Public Limited Company: *See*—
Shukla, Dipak P.; Sinclair, Keith; and Smith, Kevin A., 4,640,717, Cl. 127-58.000.
Tate, Ralph, Jr.; and Woods, John T., to Whirlpool Corporation. Refrigeration apparatus cabinet construction utilizing prepainted steel panels. 4,640,432, Cl. 220-75.000.
Tatemoto, Minoru: *See*—
Tanaka, Tadao; Chikamori, Sunao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; Kumagai,

Naotake; Abe, Hiroki; and Takizawa, Shozo, 4,640,526, Cl. 280-707.000.

Tatsumi, Susumu: *See*—
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, 4,640,129, Cl. 73-866.000.

Taylor, Arthur D.; and Upson, Thomas M., to Engelhard Corporation. Method for producing silver colored brazing alloy. 4,640,752, Cl. 204-141.500.

Taylor, Frank H., to Otis Engineering Corporation. Bleedoff tool for well test system. 4,640,363, Cl. 166-317.000.

Taylor, James A.; and Taylor, Kenneth G. Neutron logging tool. 4,641,028, Cl. 250-266.000.

Taylor, Kenneth G.: *See*—
Taylor, James A.; and Taylor, Kenneth G., 4,641,028, Cl. 250-266.000.

Taylor, William D. Safety vehicle. 4,640,527, Cl. 280-781.000.

Tazawa, Shigemoto; and Ayata, Naoki, to Canon Kabushiki Kaisha. System for controlling drive of a wafer stage. 4,641,071, Cl. 318-640.000.

Teape, John W.: *See*—
Avison, Gerald; Teape, John W.; and Willer, Paul H. F., 4,640,320, Cl. 140-93.00A.

Technomarmi Maiera S.p.A.: *See*—
Marocco, Giuseppe, 4,640,850, Cl. 428-15.000.

Tecle, Haile: *See*—
Downs, David A.; and Tecle, Haile, 4,640,925, Cl. 514-331.000.

Tecumseh Products Company: *See*—
Gannaway, Edwin L., 4,640,669, Cl. 417-410.000.

Teich, Christian M., to Deere & Company. Draft link sway block. 4,640,522, Cl. 280-460.00A.

Tektronix, Inc.: *See*—
Pollock, Ira G., 4,641,048, Cl. 307-591.000.

Teldec Schallplatten GmbH: *See*—
Knothe, Herbert; and Roschmann, Klaus, 4,640,745, Cl. 204-5.000.

Teledyne Continental Motors: *See*—
Edelmayer, Thomas C., 4,640,641, Cl. 403-150.000.

Teledyne Industries, Inc.: *See*—
Brogdon, James W.; Allen, Kenneth D.; Barton, John S.; and Hicks, Raymond J., 4,640,153, Cl. 74-789.000.
Casasent, David, 4,641,273, Cl. 364-822.000.

Tenenbaum, Daniel M.: *See*—
Tenenbaum, Marcos; De Guzman, Luis; and Tenenbaum, Daniel M., 4,640,102, Cl. 62-294.000.

Tenenbaum, Marcos; De Guzman, Luis; and Tenenbaum, Daniel M. Self-cooling container for beverages. 4,640,102, Cl. 62-294.000.

Tensiodyne Scientific Corporation: *See*—
Brull, Maurice A., 4,639,997, Cl. 29-407.000.

te Raa, Gerhardus A.: *See*—
Goossens, Laurentius M. J.; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., 4,641,333, Cl. 378-144.000.

Terano, Minoru; Yokoyama, Yasushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, to Toho Titanium Co., Ltd. Catalyst for the polymerization of olefins. 4,640,906, Cl. 502-104.000.

Testin, William J.; and French, Michael P., to RCA Corporation. Television power supply shutdown circuit. 4,641,064, Cl. 315-411.000.

Testin, William J.; and Tults, Juri, to RCA Corporation. Muting system. 4,641,190, Cl. 358-165.000.

Teufelberger Gesellschaft m.b.H.: *See*—
Kurzbock, Erich, 4,640,178, Cl. 87-6.000.

Texaco Canada Resources Ltd.: *See*—
Livesey, Declan B.; and Toma, Petre, 4,640,359, Cl. 166-276.000.

Texaco Inc.: *See*—
Kapuscinski, Maria M.; Liu, Christopher S.; Hart, William P.; and Grina, Larry D., 4,640,788, Cl. 252-51.50R.

Texas College of Osteopathic Medicine: *See*—
Meyer, Steven D.; and Raven, Peter B., 4,640,277, Cl. 128-204.230.

Texas Instruments Incorporated: *See*—
Boulanger, Henry J., 4,641,121, Cl. 337-380.000.
Garcia, Felix, Jr., 4,641,026, Cl. 250-229.000.
Kim, Bumman; and Tserng, Hua Q., 4,641,161, Cl. 357-22.000.
Malhi, Satwinder; and Baglee, David A., 4,641,173, Cl. 357-51.000.
Sacarisen, Stephen P.; and Fanini, Otto N., 4,641,308, Cl. 371-16.000.

Texscan Corporation: *See*—
Bailey, Peter D., 4,641,115, Cl. 333-181.000.

Thatcher, Richard K.: *See*—
Renner, G. Frederick; Thatcher, Richard K.; Atterbury, William G.; Harris, Jeremy M.; Hartman, Nile F.; and McCown, Robert B., 4,641,027, Cl. 250-237.00G.

Thettu, Raghulinga R.: *See*—
Garavuso, Gerald M.; Liang, Shwu-Jian; and Thettu, Raghulinga R., 4,640,504, Cl. 271-113.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H. Ballast cleaning machine with preliminary sifting conveyor. 4,640,364, Cl. 171-16.000.

Theys, Raymond A.: *See*—
Cummins, Michael; Cummins, James M.; and Theys, Raymond A., 4,640,142, Cl. 74-501.00R.

Thiel, Bernhard: *See*—
Leuker, Wilhelm; Stipsits, Gunter; and Thiel, Bernhard, 4,640,121, Cl. 73-40.50A.

Thiele, Karl E.: *See*—
Tykulsky, Alexander; Thiele, Karl E.; and Halberg, Leslie I., 4,640,292, Cl. 128-661.000.

Thin Film Technology Corporation: *See*—
Ozawa, Juichiro, 4,641,113, Cl. 333-161.000.

Thomas, Arthur, to Ford Motor Company. Dimensional checking tool. 4,640,014, Cl. 33-143.00L.

Thomas J. Lipton, Inc.: *See*—
Assinder, Ivar; Supran, Michael K.; and Thompson, Geoffrey A. K., 4,640,840, Cl. 426-399.000.

Thomas, Michael E.; Vora, Madhukar B.; and Kapoor, Ashok K., to Fairchild Camera & Instrument Corp. Method and structure for inhibiting dopant out-diffusion. 4,640,004, Cl. 29-590.000.

Thomas, Perry W. Razor construction. 4,640,012, Cl. 30-41.000.

Thompson, Geoffrey A. K.: *See*—
Assinder, Ivar; Supran, Michael K.; and Thompson, Geoffrey A. K., 4,640,840, Cl. 426-399.000.

Thomson, Thomas H., to Staodynamics, Inc. Optimized nerve fiber stimulation. 4,640,286, Cl. 128-421.000.

Thyssen Industrie Aktiengesellschaft: *See*—
Haupl, Otmar, 4,640,198, Cl. 105-168.000.

Tihanyi, Jeno , to Siemens Aktiengesellschaft. MIS-field effect transistor with charge carrier injection. 4,641,163, Cl. 357-23.400.

Timesavers, Inc.: *See*—
Stump, Lee E., 4,640,056, Cl. 51-138.000.

TL Systems Corporation: *See*—
Trechsel, Hans W., 4,640,448, Cl. 222-636.000.

Toa Harbor Works, Co., Ltd.: *See*—
Kishida, Takao; and Fukaya, Takeo, 4,640,118, Cl. 73-9.000.

Tobin, Roderick C.; and Perry, Nigel D., to Monash University. Room temperature metal vapour laser. 4,641,313, Cl. 372-56.000.

Todd, Richard S.: *See*—
Boyle, John T. A.; and Todd, Richard S., 4,640,920, Cl. 514-248.000.

Toelle, Alvin D., to Ex-Cell-O Corporation. Fluid control valve. 4,640,308, Cl. 137-596.180.

Toho Titanium Co., Ltd.: *See*—
Terano, Minoru; Yokoyama, Yasushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,640,906, Cl. 502-104.000.

Tokita, Masakazu, to Toshiba Kikai Kabushiki Kaisha. Electron beam drawing control system. 4,641,252, Cl. 364-518.000.

Toko, Inc.: *See*—
Kohayakawa, Masami, 4,641,112, Cl. 333-140.000.

Tokyo Automatic Machinery Works, Ltd.: *See*—
Takahashi, Shizuo; and Yamashita, Kiyoshi, 4,640,083, Cl. 53-551.000.

Tokyo Electric Co., Ltd.: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Ishikawa, Mamoru, 4,641,147, Cl. 346-76.0PH.

Tokyo Electric Power Co., Inc., The: *See*—
Suzuki, Mamoru; and Fukui, Shinta. 4,641,248, Cl. 364-492.000.

Tokyo Shbaura Denki Kabushiki Kaisha: *See*—
Ounuma, Shouji, 4,641,282, Cl. 365-189.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fujise, Masakuni, 4,641,328, Cl. 378-8.000.
Iizuka, Tetsuya; Fujii, Syuso; and Uchida, Yukimasa, 4,641,165, Cl. 357-23.600.
Koshigoe, Shinpei; and Fujiwara, Takeshi, 4,641,058, Cl. 313-449.000.
Mine, Susumu; and Ishizaka, Takao, 4,640,005, Cl. 29-599.000.
Sato, Shinsaku; and Yamagata, Ichiro, 4,640,664, Cl. 415-1.000.
Shiraishi, Takashi, 4,641,175, Cl. 357-39.000.
Sugai, Shinzo; Yamane, Shigemi; and Kuze, Takashi, 4,640,723, Cl. 148-411.000.
Yamazaki, Mutsuki; and Kaga, Eiichi, 4,641,168, Cl. 357-30.000.

Toma, Daniel N.: *See*—
Kushner, Gerald J.; and Toma, Daniel N., 4,640,105, Cl. 68-23.300.

Toma, Petre: *See*—
Livesey, Declan B.; and Toma, Petre, 4,640,359, Cl. 166-276.000.

Tomisawa, Norio, to Nippon Gakki Seizo Kabushiki Kaisha. Counter circuit operable in synchronism with frame or digital data signal. 4,641,326, Cl. 375-108.000.

Tomita, Masao, to Kinki Denki Co., Ltd. Impulse rocket propellant. 4,640,794, Cl. 252-194.000.

Tomkinson, John G.: *See*—
Northrup, Allan R.; and Tomkinson, John G., 4,640,416, Cl. 206-425.000.

Tomm, Dagwin: *See*—
Hartig, Franz; Fischer, Matthias; and Tomm, Dagwin, 4,640,402, Cl. 192-106.200.

Tornell, Goran. Stirring member for liquid suspensions in sealed spray containers. 4,640,623, Cl. 336-342.000.

Toshiba Automation Equipment Engineering, Ltd.: *See*—
Ando, Hideo; and Doi, Akihiko, 4,641,023, Cl. 250-216.000.

Toshiba Ceramics Co., Ltd.: *See*—
Arakawa, Kazumi; Hirao, Toshiyuki; Sugiura, Kenji; Kuroki, Satoshi; Hiraki, Sei; Suzuki, Takao; and Nakai, Ken, 4,640,336, Cl. 164-440.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Tokita, Masakazu, 4,641,252, Cl. 364-518.000.

Toshiba Silicone Co., Ltd.: *See*—
Watanabe, Junichiro; Funahashi, Yuichi; Sugiura, Kazuo; and Matsumoto, Hironori, 4,640,968, Cl. 528-32.000.

Toth, James E.: *See*—
Elsenbaumer, Ronald L.; Miller, Granville G.; and Toth, James E., 4,640,006, Cl. 29-623.100.

Toub, Melvin R.; and Finney, Donald L., to General Electric Company. Iodine resistant silicone rubber compositions. 4,640,956, Cl. 524-779.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Takeda, Hiroshi; Oshima, Noritsugu; Kubo, Tateo; and Sakaguchi, Kenichi, 4,640,673, Cl. 425-297.000.
Toyoda Gosei Co., Ltd.: *See*—
Kobayashi, Teruo; and Uchida, Sadao, 4,640,150, Cl. 74-552.000.
Noda, Kazushi; Komatsu, Moriyuki; and Mitsunaga, Hiroshi, 4,640,340, Cl. 165-41.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Harada, Osamu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, 4,640,251, Cl. 123-425.000.
Hasegawa, Akira, 4,640,148, Cl. 74-422.000.
Hayashi, Motomu; Nagai, Masayuki; and Akoshima, Shigeru, 4,640,066, Cl. 52-208.000.
Matsushima, Katsuaki; Fujioka, Yasuhiro; Sasaki, Takeshi; Fujine, Manabu; and Yamamoto, Kouji, 4,640,184, Cl. 98-2.150.
Nakane, Mototaka; and Tanaka, Shizuo, 4,640,400, Cl. 192-70.250.
Nomura, Yoshihisa; Oka, Hiroyuki; and Otsuki, Hiromi, 4,640,558, Cl. 303-119.000.
Yasukawa, Masao; and Taguchi, Yukiyasu, 4,640,147, Cl. 74-409.000.
Toyota Shatai Kabushiki Kaisha: *See*—
Shibuki, Osamu; Matsuyama, Noboru; Nagasawa, Yoshiaki; Kawai, Katsuhiro; Sakagami, Shigeru; and Onoyama, Toshiaki, 4,641,065, Cl. 318-135.000.
Tozaki, Hiroshi: *See*—
Watanabe, Yuki; and Tozaki, Hiroshi, 4,640,612, Cl. 355-87.000.
Tractor Plow Co., Inc.: *See*—
Lawrence, Ventura J.; Metcalf, Charles G.; and Silva, Lawrence H., 4,640,367, Cl. 172-225.000.
Tracy, David H.; O'Brien, Michael J.; and Bohler, Walter, to Perkin-Elmer Corporation, The. Apparatus for monitoring a plasma torch. 4,640,627, Cl. 374-121.000.
Tracy, John M.; Yeh, Pochi A.; and Khoshnevisan, Mohsen, to Rockwell International Corporation. Phase conjugate relative position sensor. 4,640,618, Cl. 356-345.000.
Trambauer, Karl: *See*—
Eibl, Johann; Schwarz, Otto; Elsinger, Fritz; Wober, Gunter; Philapitsch, Anton; Linnau, Yendra; Dorner, Friedrich; Trambauer, Karl; and Frechinger, Wolfgang, 4,640,834, Cl. 424-94.000.
Trans-Guard Industries Inc.: *See*—
Brammall, Terrence N., 4,640,538, Cl. 292-323.000.
Trautmann, Gunther: *See*—
Link, Helmut F.; Trautmann, Gunther; and Herrscher, Albert, 4,640,158, Cl. 82-3.000.
Trechsel, Hans W., to TL Systems Corporation. Volume adjustment device for powder filling apparatus. 4,640,448, Cl. 222-636.000.
Trepp, Christian, to Sulzer Brothers Limited. Apparatus for conveying and compressing a gaseous medium. 4,640,667, Cl. 417-52.000.
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., to Comienco Limited. Cover for semiconductor device packages. 4,640,438, Cl. 220-359.000.
Trine Products Corporation: *See*—
Paley, Gary, 4,640,019, Cl. 33-563.000.
Troxler Electronic Laboratories, Inc.: *See*—
Regimand, Ali, 4,641,030, Cl. 250-308.000.
Trull, Michael W.; and Powell, Richard C., to Lord Corporation. Tactile sensor. 4,640,137, Cl. 73-862.040.
Trumley, Richard L., to General Aluminum Products, Inc. Roll-formed frame for portable enclosures. 4,640,061, Cl. 52-71.000.
TRW Inc.: *See*—
Grote, Albert J.; Tahim, Raghbir S.; and Chang, Kai, 4,641,369, Cl. 455-327.000.
Tsang, Chung K. Multi-phase PSK demodulator. 4,641,323, Cl. 375-80.000.
Tserng, Hua Q.: *See*—
Kim, Bumman; and Tserng, Hua Q., 4,641,161, Cl. 357-22.000.
Tsubakimoto, Tsuneo; Fujikawa, Iwao; and Kushino, Mitsuo, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Spacers for liquid crystal display device. 4,640,584, Cl. 350-344.000.
Tsubota, Yasumasa: *See*—
Shibahata, Yasuji; Tsubota, Yasumasa; and Uno, Takaaki, 4,640,379, Cl. 180-140.000.
Tsubouchi, Haruyoshi: *See*—
Yoshioka, Masahiro; and Tsubouchi, Haruyoshi, 4,640,630, Cl. 384-129.000.
Tsuchida, Yasuyuki: *See*—
Deguchi, Yutaka; and Tsuchida, Yasuyuki, 4,640,601, Cl. 355-3.00R.
Tsuchiya, Shizuo: *See*—
Ohta, Morio; Tsuchiya, Shizuo; Nakano, Yoshito; Aikawa, Masaru; and Asaumi, Seiji, 4,641,156, Cl. 346-160.000.
Tsuchiya, Yukio; and Matsukawa, Yutaka, to Pioneer Electronic Corporation. Wall-mounted resin speaker cabinet. 4,640,381, Cl. 181-144.000.
Tsuji, Eiji: *See*—
Abura, Yoshinori; Tsuji, Eiji; Okuyama, Kenji; and Ochi, Shuhei, 4,641,010, Cl. 219-222.000.
Tsukada, Keizo; and Yamagata, Masato. Cordless telephone. 4,640,987, Cl. 379-62.000.
Tsuneo, Ishino, to Nippon Filcon Co., Ltd. Forming fabric for use in a papermaking machine. 4,640,741, Cl. 162-202.000.
Tsuno, Koichi, to Sumitomo Electric Industries, Ltd. Image fiber with a mechanism for rotating a field of view. 4,640,577, Cl. 350-96.250.
Tubular Fabricators Industry, Inc.: *See*—
Battiston, Joseph D., Sr.; and Battiston, Joseph, Jr., 4,640,301, Cl. 135-67.000.
Tucciarone, Aldo: *See*—
Antonini, Bruno; Borghese, Camillo; D'Amico, Arnaldo; DeGasperis, Paolo; Paoletti, Antonio; Paroli, Paolo; Petrocco, Giovanni; Tucciarone, Aldo; and Scarinci, Fernando, 4,640,629, Cl. 374-178.000.
Tufte, Jerold W. Platform device. 4,640,483, Cl. 248-311.200.
Tufts, Timothy A.: *See*—
Goel, Anil B.; Tufts, Timothy A.; and Blackburn, Peggy A., 4,640,969, Cl. 528-73.000.
Tults, Juri: *See*—
Testin, William J.; and Tults, Juri, 4,641,190, Cl. 358-165.000.
Tunnell, George; Pomernacki, Charles L.; and Gregg, Jack P. Voice controlled welding system. 4,641,292, Cl. 367-198.000.
Turner, Charles F. R.; and Wingfield, John V., to Prior Scientific Instruments Limited. Optical inspection device for inspecting an article surface. 4,640,578, Cl. 350-239.000.
Turner, Joe D. Awning support assembly. 4,640,332, Cl. 160-46.000.
Turner, Michael J. B.; Hanley, Michael; and Hartwell, Eric S., to National Research Development Corporation. Animal separator. 4,640,231, Cl. 119-155.000.
Twibell, John D.: *See*—
Kind, Stuart S.; Sanger, David G.; Twibell, John D.; and Hargraves, John, 4,640,035, Cl. 40-625.000.
Tykulsky, Alexander; Thiele, Karl E.; and Halberg, Leslie I., to Hewlett-Packard Company. Extending sample volume in pulsed Doppler systems. 4,640,292, Cl. 128-661.000.
Uchida, Sadao: *See*—
Kobayashi, Teruo; and Uchida, Sadao, 4,640,150, Cl. 74-552.000.
Uchida, Yukimasa: *See*—
Iizuka, Tetsuya; Fujii, Syuso; and Uchida, Yukimasa, 4,641,165, Cl. 357-23.600.
Uchikawa, Yoshiro: *See*—
Oguchi, Kikuo; and Uchikawa, Yoshiro, 4,640,582, Cl. 350-333.000.
Uchiyama, Masaki: *See*—
Mitsuhashi, Yasuo; Uchiyama, Masaki; Murakawa, Kazunori; and Okado, Kenji, 4,640,882, Cl. 430-110.000.
Ueda, Hiroshi: *See*—
Sawa, Shigeki; and Ueda, Hiroshi, 4,640,283, Cl. 128-395.000.
Uehara, Keijiro; Higuchi, Hisayuki; and Hayasaka, Akio, to Hitachi, Ltd. Method of forming bipolar transistors with graft base regions. 4,640,721, Cl. 148-188.000.
Ueno, Kuniki; and Takahashi, Naotomi, to Mitsui Mining and Smelting Co., Ltd. Process for surface treatment of copper product. 4,640,747, Cl. 204-37.100.
Ueno, Masayuki: *See*—
Koike, Yuzuru; Koike, Akihiko; and Ueno, Masayuki, 4,640,244, Cl. 123-339.000.
Ulrich, Helmut: *See*—
Fauck, Gerhard; Kiel, Bernd; and Ulrich, Helmut, 4,640,556, Cl. 303-22.00R.
Underhill, Philip O. Portable scaffolding. 4,640,385, Cl. 182-113.000.
Unger, Hans-Georg, to ANT Nachrichtentechnik GmbH. Integrated, micro-optical device. 4,640,574, Cl. 350-96.110.
Union Carbide Corporation: *See*—
Ostrozynski, Robert L.; Greene, George H.; and Merrifield, James H., 4,640,962, Cl. 525-474.000.
Union Connector Co., Inc.: *See*—
Kalbfeld, Jack W., 4,640,984, Cl. 174-135.000.
Uniroyal Chemical Company, Inc.: *See*—
Strunk, Richard J.; and Moore, Richard C., 4,640,927, Cl. 514-342.000.
Unisearch Limited: *See*—
Farrell, Peter C.; Bertram, Christopher D.; and Milthorpe, Bruce K., 4,640,896, Cl. 436-34.000.
United Coal Company: *See*—
Smith, Lloyd B., 4,640,770, Cl. 210-144.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Griffin, Eric J.; Collier, Richard J.; and Hjipieris, George, 4,641,082, Cl. 324-58.00B.
Kind, Stuart S.; Sanger, David G.; Twibell, John D.; and Hargraves, John, 4,640,035, Cl. 40-625.000.
United States of America
Air Force: *See*—
Archambeault, Bruce R.; and Rancour, David P., 4,641,358, Cl. 382-68.000.
Hemler, Paul F.; and Rohr, William A., 4,640,499, Cl. 267-160.000.
Masak, Raymond J., 4,641,141, Cl. 342-379.000.
Strate, Edward A., 4,640,570, Cl. 339-182.00R.
Strong, David, 4,641,250, Cl. 364-507.000.
Energy: *See*—
Butler, Michael A.; and Ginley, David S., 4,641,037, Cl. 250-390.000.
Coffield, Frederick E., 4,641,087, Cl. 324-83.00R.
Cutburth, Ronald W., 4,640,591, Cl. 350-632.000.
Green, Lanny A.; and Heck, Joaquim L., Jr., 4,641,329, Cl. 378-79.000.
Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., 4,641,099, Cl. 324-323.000.
Wang, Jin S.; Lakin, Kenneth M.; and Landin, Allen R., 4,640,756, Cl. 204-192.180.

Navy: *See*—
Mitchell, Donald L., 4,641,254, Cl. 364-580.000.
Papanicolaou, Nicolas A., 4,640,003, Cl. 29-576.00B.
Rose, Millard F., 4,640,180, Cl. 89-8.000.

U.S. Philips Corporation: *See*—
Demmer, Walter H., 4,641,131, Cl. 340-347.0DA.
Foxon, Charles T., 4,640,720, Cl. 148-175.000.
Gerkema, Jan, 4,641,332, Cl. 378-125.000.
Goossens, Laurentius M. J.; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., 4,641,333, Cl. 378-144.000.
Martens, Theodorus G. J. A.; Steenhof, Frits A.; and Kalfs, Johannes J. W., 4,641,310, Cl. 371-38.000.
Naaijer, Geert J., 4,640,995, Cl. 200-11.0DA.
Rammos, Emmanuel, 4,641,145, Cl. 343-798.000.
Sanders, Rudolf; and Rijckaert, Josephus F., 4,641,056, Cl. 313-51.000.
Schouhamer Immink, Kornelis A., 4,641,128, Cl. 340-347.0DD.
Van Deursen, Theodorus H. M.; and Wassink, Derk J. C., 4,641,367, Cl. 455-161.000.

U.S. Product Development Company: *See*—
Adell, Robert, 4,639,948, Cl. 2-338.000.

U.S. Vanadium Corporation: *See*—
Goddard, John B., 4,640,823, Cl. 423-68.000.

United Technologies Corporation: *See*—
Coburn, Robert E.; and Matthews, John A., 4,640,092, Cl. 60-39.360.
Sharon, Harold M., 4,639,991, Cl. 29-156.80B.

Unitika Ltd.: *See*—
Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, 4,640,971, Cl. 528-129.000.

Universal Leaf Tobacco Company, Incorporated: *See*—
Coleman, G. A. John, 4,640,300, Cl. 131-318.000.

Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., KG: *See*—
Schieber, Hans, 4,640,103, Cl. 66-64.000.

Universal Symetrics Corporation: *See*—
Mednis, Juris M., 4,640,423, Cl. 215-10.000.

University of California, The Regents of the: *See*—
Wudl, Fred; Kobayashi, Masao; and Heeger, Alan, 4,640,748, Cl. 204-59.00R.

University of Cincinnati: *See*—
Lee, Kew-Ho; and Khang, Soon-Jai, 4,640,901, Cl. 501-81.000.

University of Delaware, The: *See*—
Phillips, James E.; and Lasswell, Patrick G., 4,640,002, Cl. 29-574.000.

University of Health Sciences/The Chicago Medical School: *See*—
Halfman, Clarke J., 4,640,898, Cl. 436-546.000.

University of Illinois: *See*—
Mangel, Walter F.; Leytus, Stephen; and Melhado, L. Lee, 4,640,893, Cl. 435-23.000.

Uno, Takaaki: *See*—
Shibahata, Yasuji; Tsubota, Yasumasa; and Uno, Takaaki, 4,640,379, Cl. 180-140.000.

Upp, Daniel C.: *See*—
Van Simaeys, Francoise C. G.; Leurs, Anna M. C.; Upp, Daniel C.; Lawrence, Alan J.; and Cotton, John M., 4,641,301, Cl. 370-58.000.

Upson, Thomas M.: *See*—
Taylor, Arthur D.; and Upson, Thomas M., 4,640,752, Cl. 204-141.500.

Urayama, Yuji: *See*—
Kawade, Hideji; Takahashi, Hideaki; Sato, Yoshiyuki; and Urayama, Yuji, 4,640,990, Cl. 379-77.000.

Ury, Michael G.: *See*—
Petelin, Andrei N.; Sharp, Celia M.; Ury, Michael G.; and Wooden, Gene R., 4,641,033, Cl. 250-492.100.

USM Corporation: *See*—
Binder, Hans, 4,639,964, Cl. 12-142.0LC.

UZI R & D Associates: *See*—
Gal, Uzi, 4,640,036, Cl. 42-72.000.

Vaders, Dennis H., to Weyerhaeuser Company. Flail member for debarking trees. 4,640,325, Cl. 144-208.00J.

Vaile, James T.: *See*—
McMahon, Raymond D.; Jellovitz, John C.; Vaile, James T.; Renn, Gregory J.; and Ondeck, Elmer J., 4,640,165, Cl. 83-346.000.

Vainio, Frans: *See*—
Hetemaa, Kalevi; Naumanen, Esko; and Vainio, Frans, 4,640,459, Cl. 238-122.000.

Vali, Ena, to Westinghouse Canada Inc. Variable bandwidth low-pass filter for line tracer accuracy control. 4,641,021, Cl. 250-202.000.

Valla, Jean: *See*—
Abbes, Claude; Rouaud, Christian; Valla, Jean; Forges, Robert; and de Villepoix, Raymond, 4,640,530, Cl. 285-18.000.

Vallee, Gerard: *See*—
Semedard, Jean-Claude; Marsault, Jean-Jacques; Peyrelongue, Jean-Pierre; and Vallee, Gerard, 4,640,480, Cl. 248-62.000.

VanDahm, Richard A.: *See*—
Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., 4,640,690, Cl. 8-506.000.

van den Heuvel, Anthony P.: *See*—
Derfiny, Dennis J.; van den Heuvel, Anthony P.; and Edguer, Nihat S., 4,641,222, Cl. 361-403.000.

van der Eerden, Henricus F. J. M., to Stork PMT B.V. Device for cutting off the tail of slaughtered poultry. 4,639,973, Cl. 17-11.000.

van der Eerden, Her icus F. J. M., to Stork PMT B.V. Device for separating the legs from a carcass portion of slaughtered poultry. 4,639,975, Cl. 17-11.000.

Vandervoort, John R., to Eaton Corporation. Multiple countershaft transmission. 4,640,145, Cl. 74-325.000.

Van Deursen, Theodorus H. M.; and Wassink, Derk J. C., to U.S. Philips Corporation. Receiver for FM signals with transmitter status code storage. 4,641,367, Cl. 455-161.000.

Vandevoir, Claude: *See*—
Geiser, Markus; and Vandevoir, Claude, 4,640,157, Cl. 82-2.700.

van Ditten, Jurjen L.: *See*—
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Van Gompel, Paul T.: *See*—
Ales, Thomas M.; Strohbeen, David T.; Damico, Joyce A.; Van Gompel, Paul T.; and Abel, Kent W., 4,639,949, Cl. 2-400.000.

Van Hoomissen, Robert L.; Briscoe, Terry L.; and Barker, Don P. S., to ESCO Corporation. Dump block for dragline bucket. 4,640,496, Cl. 254-415.000.

Vanmeurs, Peter; Waxman, Monroe H.; and Vinegar, Harold J., to Shell Oil Company. In-situ steam drive oil recovery process. 4,640,352, Cl. 166-245.000.

van Rheenen, Bernhard J. P.: *See*—
Goossens, Laurentius M. J.; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., 4,641,333, Cl. 378-144.000.

Van Rooijen, Gerardus H., to Chore-Time Equipment, Inc. Rotating helical conveyor system. 4,640,230, Cl. 119-52.0AF.

Vansant, Jan; Overbergh, Noel; Buekers, Valere; and Pieck, Amandus L. E., to N.V. Raychem S.A. Branch-off technique. 4,641,009, Cl. 219-200.000.

Van Simaeys, Francoise C. G.; Leurs, Anna M. C.; Upp, Daniel C.; Lawrence, Alan J.; and Cotton, John M., to International Standard Electric Corporation. Telecommunication switching system and priority arrangement used therein. 4,641,301, Cl. 370-58.000.

Varga, LeRoy M.; and Yermal, Michael F., to Rockaway Corporation. Wire bend machine. 4,640,321, Cl. 140-93.00C.

Varnon, James W. Hood or cover used to eradicate fire ants. 4,640,044, Cl. 43-132.100.

Vassallo, Donald A.; and Zunker, David W., to Du Pont de Nemours, E. I., and Company. Polyvinyl alcohol based wax-free size composition. 4,640,946, Cl. 524-45.000.

VDO Adolf Schindling AG: *See*—
Schneider, Dieter, 4,640,127, Cl. 73-295.000.

VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Naumann, Reinhard, 4,640,503, Cl. 271-103.000.

Venkitakrishnan, Padmanabha I.: *See*—
Laugesen, Ronald C.; and Venkitakrishnan, Padmanabha I., 4,641,247, Cl. 364-490.000.

Verhoeven, John D.: *See*—
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Verrerie Cristallerie d'Arques J. G. Durand & Cie: *See*—
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Vetter, Robert W., Jr.: *See*—
Kemper, Kyran B.; and Vetter, Robert W., Jr., 4,641,299, Cl. 370-15.000.

Viard, Alain: *See*—
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Victor Company of Japan, Ltd.: *See*—
Ichinoi, Yutaka; and Nishimoto, Naomichi, 4,641,201, Cl. 358-310.000.
Iwafune, Kasuke, 4,641,206, Cl. 360-33.100.
Kato, Shigeru; Osada, Naomi; Ichitoh, Toshikatsu; Murata, Masae; and Mochizuki, Masfumi, 4,641,151, Cl. 346-76.0PH.
Kawade, Hideji; Takahashi, Hideaki; Sato, Yoshiyuki; and Urayama, Yuji, 4,640,990, Cl. 379-77.000.
Kohno, Teruo, 4,640,481, Cl. 248-126.000.
Matsumoto, Yukio; and Hanayama, Masaru, 4,640,863, Cl. 428-323.000.
Sugiyama, Hiroyuki, 4,641,204, Cl. 358-341.000.

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Vinegar, Harold J.: *See*—
Vanmeurs, Peter; Waxman, Monroe H.; and Vinegar, Harold J., 4,640,352, Cl. 166-245.000.

Vinson, Edward F.: *See*—
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VMX, Inc.: *See*—
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Vo, Hung A.: *See*—
Lalloz, Paul; and Vo, Hung A., 4,641,270, Cl. 364-476.000.

Vogl, Herbert, to Siemens Aktiengesellschaft. Method and circuit arrangement for the transmission of data signal bits occurring with a first bit rate in a bit stream having a second bit rate which is higher than the first bit rate. 4,641,303, Cl. 370-84.000.

Voit, William F., Jr.: *See*—
Dyer, Stanley; Molloy, James J.; Nguyen, Thoi; Riherd, David M.; Voit, William F., Jr.; and West, Donald L., 4,641,148, Cl. 346-76.0PH.

Volk, David. Aspheric contact lens. 4,640,595, Cl. 351-160.00R.

Vonau, Vincent: *See*—
Blancheton, Jean-Paul; Calvas, Jacques; Michel, Alain H.; and Vonau, Vincent, 4,640,227, Cl. 119-2.000.

von Sivers, Rolf: *See—*
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von Wimmersperg, Heinrich F. Lock for vehicle infant restraint. 4,640,545, Cl. 297-216.000.

Vora, Madhukar B.: *See—*
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Vruggink, Arend: *See—*
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W. E. Bassett Company, The: *See—*
Gamble, William L., 4,640,011, Cl. 30-28.000.

W. R. Grace & Co., Cryovac Div.: *See—*
Ferguson, Daniel J.; Schirmer, Henry G.; and Mueller, Walter B., 4,640,856, Cl. 428-36.000.

W. Schlafhorst & Co.: *See—*
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WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
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Wacker, Oskar: *See—*
Baschang, Gerhard; Hartmann, Albert; and Wacker, Oskar, 4,640,911, Cl. 514-42.000.

Wacom Co., Ltd.: *See—*
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Wade, James: *See—*
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Wagers, William C.: *See—*
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Wagman, Mark E., to Du Pont de Nemours, E. I., and Company. Stabilized polyoxymethylene compositions. 4,640,949, Cl. 524-227.000.

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Coleman, Edward C.; Wagner, Jeffrey D.; Ballard, Donna J.; Stone, Catharine E.; Swallow, Nancy A.; and Carey, Nancy L., 4,640,837, Cl. 426-94.000.

Wakai, Shinzi, to Nissan Motor Co., Ltd. Flow velocity distribution detecting system. 4,640,316, Cl. 139-1.00R.

Waki, Kouichirou: *See—*
Higashi, Haruki; Yashiki, Seiji; Waki, Kouichirou; and Kikuchi, Toshiyuki, 4,640,394, Cl. 192-3.290.

Walborn, John B. Escape device. 4,640,388, Cl. 182-231.000.

Walker, Jerry L.: *See—*
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Walker, John G., to Bowthorpe-Hellermann Limited. Automatic tie gun. 4,640,319, Cl. 140-93.00A.

Walker, Loren H.; and Lezan, Georges R. E., to General Electric Company. Apparatus and method for failure testing of a control turn-off semiconductor. 4,641,231, Cl. 363-58.000.

Walker, William T. Safety gas can with plural, nestable dispensing means. 4,640,446, Cl. 222-416.000.

Wallick, William P.; and Hoffman, Gary J., to Wallick, William P. Food coring device. 4,640,187, Cl. 99-538.000.

Walsh, Patrick M., to AT&T Bell Laboratories. Access-arbitration scheme. 4,641,266, Cl. 364-200.000.

Walter Electrical Manufacturing Company: *See—*
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Walter, Gerard S.; and Hagan, John, to Walter Electrical Manufacturing Company. Electrical connector blocks. 4,640,571, Cl. 339-242.000.

Wang, Jin S.; Lakin, Kenneth M.; and Landin, Allen R., to United States of America, Energy. Method of making a piezoelectric shear wave resonator. 4,640,756, Cl. 204-192.180.

Warga, Johann: *See—*
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Warin, Francis J.: *See—*
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Warner-Lambert Company: *See—*
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Warren, David M.: *See—*
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Warrick, Julian E., to Zenith Electronics Corporation. Digital vertical sync filter. 4,641,189, Cl. 358-154.000.

Warzawski, Bernard; and Fauvel, Pierre, to Occidental Chemical Corp. Fuel cell structures. 4,640,876, Cl. 429-37.000.

Wasley, Bernard. Cap for a carbonated beverage bottle. 4,640,426, Cl. 215-228.000.

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Watanabe, Hiroyuki: *See—*
Koiwai, Sakae; Asaoka, Keizo; Shirasawa, Katsuhiko; Watanabe, Hiroyuki; and Honda, Junichi, 4,640,001, Cl. 29-572.000.

Watanabe, Junichiro; Funahashi, Yuichi; Sugiura, Kazuo; and Matsumoto, Hironori, to Toshiba Silicone Co., Ltd. Ethylidene norbornyl group-containing polysiloxane. 4,640,968, Cl. 528-32.000.

Watanabe, Masao: *See—*
Nakada, Seiichi; Hanada, Tool; and Watanabe, Masao, 4,640,028, Cl. 38-77.700.

Watanabe, Masayoshi, to Hitachi, Ltd. Device for mounting an information carrying disc member. 4,641,297, Cl. 369-75.200.

Watanabe, Takao; and Watari, Masao, to NEC Corporation. Voice input system. 4,641,342, Cl. 381-41.000.

Watanabe, Tetunobu: *See—*
Tanaka, Jouji; Watanabe, Tetunobu; Tanimoto, Yoshiji; and Okumura, Minoru, 4,641,337, Cl. 379-162.000.

Watanabe, Yuki; and Tozaki, Hiroshi, to Hosen Printing Co., Ltd. Method and apparatus for controlling continuously operation of automatic photo-composer. 4,640,612, Cl. 355-87.000.

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Watase, Hideo: *See—*
Konishi, Yozo; Akashi, Kichizo; Watase, Hideo; and Yoshioka, Tatsuo, 4,641,271, Cl. 364-478.000.

Watjer, Sheldon J.; and Boerema, Edward T., to Prince Corporation. Mobile telephone mount for a vehicle. 4,640,542, Cl. 296-37.800.

Watson, Bruce W.: *See—*
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Watson, Keith G.: *See—*
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Watson, Michael H.: *See—*
Day, George D.; Flack, John K.; Golledge, Ian; Hillary, Christopher J.; Pike, John V.; and Watson, Michael H., 4,640,485, Cl. 248-422.000.

Watson, Norman F., to EKA Group Ltd. Recovery and towing vehicle. 4,640,660, Cl. 414-563.000.

Watteredge-Uniflex, Inc.: *See—*
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Waxman, Monroe H.: *See—*
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Waye, Jerome D.: *See—*
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Wayland, James R., Jr.: *See—*
Lee, David O.; Montoya, Paul C.; and Wayland, James R., Jr., 4,641,099, Cl. 324-323.000.

Wear, Frederick C.; and McKinney, Howard F., to McDonnell Douglas Corporation. Zoned microwave drying apparatus and process. 4,640,020, Cl. 34-1.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Lucius, Werner, 4,640,262, Cl. 126-110.00B.

Webb, Grandville S., Jr. Demountable carrier for mounting on vehicles. 4,640,658, Cl. 414-462.000.

Weber, Robert; and Forster, Josef, to Kraftwerk Union Aktiengesellschaft. Tube lane manipulator for the high-pressure blow-down of heat exchangers. 4,640,346, Cl. 165-95.000.

Weeks, Donald L.: *See—*
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Wegner, Gerhard: *See—*
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Wehking, Wolfgang: *See—*
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Wei, Lee-Fang, to Codex Corporation. Frame synchronization in trellis-coded communication systems. 4,641,327, Cl. 375-114.000.

Weingartner, Rudolf, to Kremsmunster, Austria. Insulated container and insulating element therefor. 4,640,437, Cl. 220-400.000.

Weiss, Ekkehard: *See—*
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Welch, Timothy M.: *See—*
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Wellar, Mark E.: *See—*
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Wells, Peter M.: *See—*
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Wells, Thomas J.; and Serafini, Angelo, to Leggett & Platt, Incorporated. Bedding and seating product having double twist coil spring and method and apparatus for manufacturing the same. 4,639,957, Cl. 5-248.000.

Wemhoff, Mark F. Apparatus for photographic film processor pollution control. 4,640,769, Cl. 210-96.100.

West, Donald L.: *See—*
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Westcan Manufacturing Ltd.: *See—*
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Westenskow, Glen A.: *See—*
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Westinghouse Electric Corp.: *See—*
Appleman, Robert H., 4,640,342, Cl. 165-69.000.
Cooper, Frank W., Jr.; Howard, Bruce A.; and Snyder, David A., 4,639,994, Cl. 29-402.010.

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Draper, Robert; and Smith, Edward H., 4,640,233, Cl. 122-488.000.
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Kapoor, Anoop, 4,639,993, Cl. 29-400.00N.
Levino, Andre J., 4,640,086, Cl. 57-3.000.
Makiel, Joseph M., 4,640,875, Cl. 429-30.000.
Shallenberger, John M.; and Ferlan, Stephen J., 4,639,998, Cl. 29-426.500.
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Shutterly, Harold B., 4,641,371, Cl. 455-601.000.
Shutterly, Harold B., 4,641,373, Cl. 455-601.000.
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Wetzel, Rodney J., to Baker Oil Tools, Inc. Perforating gun for initiation of shooting from bottom to top. 4,640,370, Cl. 175-4.600.

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Whalen, Charles E.; and Hoover, Wilbur G., to Caterpillar, Inc. Fluid intake screening device. 4,640,771, Cl. 210-167.000.

Wheatley, William M.: *See*—
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Whirlpool Corporation: *See*—
Tate, Ralph, Jr.; and Woods, John T., 4,640,432, Cl. 220-75.000.

White, Alan C.; Shepherd, Robin G.; and Langham, Barry J., to John Wyeth & Brother Limited. Thienoquinolizines and their use as α_2-adrenoceptor antagonists. 4,640,924, Cl. 514-291.000.

White Consolidated Industries, Inc.: *See*—
Johnson, Roger E., 4,640,305, Cl. 137-312.000.

White, Leonard A., to Baxter Travenol Laboratories, Inc. Self-opening nipple construction and nursing container. 4,640,424, Cl. 215-11.00R.

Whitehead, James M. M., to RCA Corporation. Joystick control. 4,641,123, Cl. 338-128.000.

Whittaker, Edward J. W., to International Standard Electric Corporation. Telephone subscribers' circuits. 4,640,993, Cl. 379-383.000.

Widener, Wade H.; and Klapper, Kenneth K., to Westinghouse Electric Corp. End plug orientation device. 4,640,407, Cl. 198-389.000.

Wilhelm Fette GmbH: *See*—
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Wilhelm H. Kullmann Wikus-Sagenfabrik: *See*—
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Wilhelm, Wilhelm, to Siemens Aktiengesellschaft. Circuit for reading bipolar storage cells. 4,641,283, Cl. 365-190.000.

Willard, Henry G., to General Electric Company. Combined accessory and trip actuator unit for electronic circuit breakers. 4,641,117, Cl. 335-7.000.

Willcocks, Kenneth, to Beecham Group p.l.c. 4-(2-hydroxy-1-pyrrolidinyl and 1-piperidinyl)-2H-benzo[b]-pyran-3-ol derivatives. 4,640,928, Cl. 514-422.000.

Willer, Paul H. F.: *See*—
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Williams, Barry C., to Polydrain, Inc. Sidewall extension for drain channel system and method for extending the continuous slope of a drainage channel system. 4,640,643, Cl. 404-4.000.

Williams, Leslie P., to Cause Consequence Analysis, Inc. Foam-applying nozzle. 4,640,461, Cl. 239-317.000.

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Williams Patent Crusher and Pulverizer Company: *See*—
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Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Fluidized bed combustion apparatus and method of operating same. 4,640,204, Cl. 110-347.000.

Williams, Robert M.; and Beckwith, Elaine C., to Ford Motor Company. Method of making yttrium silicon oxy compound. 4,640,826, Cl. 423-263.000.

Willis, Frank M.: *See*—
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Willison, Beverly G., to Feco Engineered Systems, Inc. Rotational and retractable container holding device and conveyor therefor. 4,640,406, Cl. 198-377.000.

Wilson, John F.: *See*—
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Wilson, Monti R.; Hutchison, Victor E.; Bendure, William J.; and Anderson, Frederick W., to Opti-Copy, Inc. Method and apparatus for registering color separation film. 4,641,244, Cl. 364-475.000.

Wilson, Patricia A.: *See*—
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Wilson, T. Woodrow. Spacer washer for concrete form tie rods. 4,640,490, Cl. 249-214.000.

Windel, Bernd: *See*—
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Wing, Anders; and Nicklasson, Christer. Brake device. 4,640,520, Cl. 280-47.310.

Wingfield, John V.: *See*—
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Winkler, Dietmar: *See*—
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Winner, Kurt W.; and Cangialosi, Ignazio. Window sash assembly. 4,640,048, Cl. 49-181.000.

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Winter, Dean C.: *See*—
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Winthrop, Marilyn P. Apparatus for dispensing and applying nail polish. 4,640,637, Cl. 401-101.000.

Wissner, Allan; Schaub, Robert E.; and Sum, Phaik E., to American Cyanamid Company. Phosphocholine derivatives having antihypertensive action. 4,640,913, Cl. 514-77.000.

Witt, Wolfram; and Scholles, Herbert, to Rheinmetall GmbH. Airborne arrangement for producing a projectile. 4,640,194, Cl. 102-425.000.

Wittren, Richard A., to Deere & Company. Flow amplifying steering system. 4,640,094, Cl. 60-385.000.

Wober, Gunter: *See*—
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Wolmarans, Johann R. Hitch assembly. 4,640,523, Cl. 280-491.00D.

Wolter, Albrecht; Hartmann, Rolf; Herchenbach, Horst; and Grisar, Alexander, to Klockner-Humboldt Deutz Aktiengesellschaft; and Dyckerhoff Engineering GmbH. Method and apparatus for burning combustible waste materials. 4,640,203, Cl. 110-346.000.

Wolter, Albrecht: *See*—
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Wood, Marcus B.; and Owen, Richard K. Combination envelope and display device. 4,640,030, Cl. 40-158.00R.

Wooden, Gene R.: *See*—
Petelin, Andrei N.; Sharp, Celia M.; Ury, Michael G.; and Wooden, Gene R., 4,641,033, Cl. 250-492.100.

Woods, H. John; and Souhrada, Frank, to Gulf Canada Corporation. Process for improving the yield of distillables in hydrogen donor diluent cracking. 4,640,762, Cl. 208-56.000.

Woods, John G.; and Rooney, John M., to Loctite (Ireland) Limited. Meta-bridged styryloxy resins. 4,640,849, Cl. 427-54.100.

Woods, John T.: *See*—
Tate, Ralph, Jr.; and Woods, John T., 4,640,432, Cl. 220-75.000.

Wortzman, Mitchell S.: *See*—
Fong, John; Wortzman, Mitchell S.; and Scott, Richard A., 4,640,932, Cl. 514-714.000.

Wossner, Heinz. Motor vehicle. 4,640,377, Cl. 180-9.100.

Wright, Donald R., to Dow Chemical Company, The. Process to form generally rigid cushion packages from loose fill dunnage. 4,640,080, Cl. 53-449.000.

Wright, John K.: *See*—
Hogan, Dennis R.; and Wright, John K., 4,641,127, Cl. 379-40.000.

Wright, John W. Adobe block press. 4,640,671, Cl. 425-149.000.

Wudl, Fred; Kobayashi, Masao; and Heeger, Alan, to University of California, The Regents of the. Polyisothianaphtene, a new conducting polymer. 4,640,748, Cl. 204-59.00R.

Wuepper, Thomas E.: *See*—
McKibben, Kenneth D.; Gould, Alan P.; Groh, Craig J.; and Wuepper, Thomas E., 4,639,968, Cl. 15-304.000.

Wunsch, Erich, to Efrudec GmbH. Apparatus providing rapid adjustment of a mirror. 4,640,590, Cl. 350-632.000.

Wurmli, Arthur: *See*—
Stalder, Herbert; Baumgartner, Josef; and Wurmli, Arthur, 4,640,089, Cl. 57-401.000.

Wurst, Walter K., to ITT Corporation. Digital tie line. 4,641,300, Cl. 370-16.000.

Wyant, Clifton M.: *See*—
Simmons, Robert L., Sr.; and Wyant, Clifton M., 4,641,291, Cl. 367-157.000.

Xerox Corporation: *See*—
Daniele, Joseph J., 4,639,999, Cl. 29-569.00L.
Fullmer, David M., 4,639,996, Cl. 29-407.000.
Garavuso, Gerald M.; Liang, Shwu-Jian; and Thettu, Raghulinga R., 4,640,504, Cl. 271-113.000.
Holman, Robert L., 4,640,736, Cl. 156-603.000.
Redding, Thomas P.; and Barker, Laurence S., 4,640,602, Cl. 355-3.0SH.

Yabuki, Yoshiharu; Sato, Kozo; Kawata, Ken; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,640,891, Cl. 430-551.000.

Yabuki, Yoshiharu: *See*—
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kozo; and Hirai, Hiroyuki, 4,640,892, Cl. 430-617.000.

Yabushita, Masaharu; Nohmi, Makoto; Fujikura, Nobuyuki; Miyamoto, Shoji; and Ihara, Hirokazu, to Hitachi, Ltd. Bus control method and apparatus. 4,641,237, Cl. 364-200.000.

Yagi, Kenji: *See*—
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, 4,640,996, Cl. 200-19.00R.
Yamada, Makoto: *See*—
Tajima, Osamu; Yamada, Makoto; Hagino, Hideo; and Nishizawa, Nobuyoshi, 4,640,873, Cl. 429-24.000.
Yamada, Manabu: *See*—
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, 4,640,996, Cl. 200-19.00R.
Yamada, Michihiro: *See*—
Mashiko, Koichiro; Yamada, Michihiro; Arimoto, Kazutami; Miyamoto, Hiroshi; Kobayashi, Toshifumi; and Morooka, Yoshikazu, 4,641,281, Cl. 365-189.000.
Yamada, Yasuaki: *See*—
Ozawa, Toshiaki; Yamada, Yasuaki; and Kondo, Hiroatsu, 4,640,634, Cl. 400-144.200.
Yamada, Yasuyuki, to Nikkiso Co., Ltd. Portable and wearable injector of mini size. 4,640,445, Cl. 222-386.500.
Yamagata, Ichiro: *See*—
Sato, Shinsaku; and Yamagata, Ichiro, 4,640,664, Cl. 415-1.000.
Yamagata, Masato: *See*—
Tsukada, Keizo; and Yamagata, Masato, 4,640,987, Cl. 379-62.000.
Yamagishi, Jun; and Nishikawa, Hiromitu, to Ohi Seisakusho Co., Ltd. Automatic sliding door system for vehicles. 4,640,050, Cl. 49-280.000.
Yamaguchi, Shunzo: *See*—
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, 4,640,996, Cl. 200-19.00R.
Yamaguchi, Tosinobu; Aitoh, Sigeru; and Hamasaki, Masafumi. Food and drink warming container. 4,640,264, Cl. 126-263.000.
Yamamoto, Akito: *See*—
Hosaka, Akio; and Yamamoto, Akito, 4,640,250, Cl. 123-425.000.
Yamamoto, Kouji: *See*—
Matsushima, Katsuaki; Fujioka, Yasuhiro; Sasaki, Takeshi; Fujine, Manabu; and Yamamoto, Kouji, 4,640,184, Cl. 98-2.150.
Yamamoto, Shinichi; Ito, Toshihiko; and Asano, Mitsuru, to Nippon Soken, Inc. Method for producing extrusion die for forming a honeycomb structure. 4,640,454, Cl. 228-161.000.
Yamamoto, Shinichiro: *See*—
Nishino, Kenichi; Kobayashi, Atsuo; Higashi, Sachio; Yamamoto, Shinichiro; and Yasuda, Kiyoshi, 4,640,950, Cl. 524-265.000.
Yamamoto, Toshiyuki: *See*—
Matsuura, Takanobu; and Yamamoto, Toshiyuki, 4,641,150, Cl. 346-76.0PH.
Yamana, Toshifumi: *See*—
Kato, Hiroyuki; and Yamana, Toshifumi, 4,640,261, Cl. 126-39.00J.
Yamane, Shigemi: *See*—
Sugai, Shinzo; Yamane, Shigemi; and Kuze, Takashi, 4,640,723, Cl. 148-411.000.
Yamano, Fumiyuki: *See*—
Nitta, Yoshihiko; Okajima, Atsushi; and Yamano, Fumiyuki, 4,641,264, Cl. 364-900.000.
Yamao, Mutsunori: *See*—
Echigo, Yoshiaki; Yamao, Mutsunori; Suematu, Yoshiyuki; Ishikura, Tadashi; Asami, Keiichi; and Shidei, Ritsuko, 4,640,971, Cl. 528-129.000.
Yamashita, Kiyoshi: *See*—
Takahashi, Shizuo; and Yamashita, Kiyoshi, 4,640,083, Cl. 53-551.000.
Yamauchi, Hirofumi: *See*—
Nakamura, Saburo; Matsuoka, Tsutomu; Yamauchi, Hirofumi; and Sahara, Masanori, 4,640,252, Cl. 123-446.000.
Yamauchi Rubber Industry Co., Ltd.: *See*—
Okumura, Kunio; Fukuyama, Yasuo; and Tanaka, Atsuo, 4,640,808, Cl. 264-46.500.
Yamazaki, Heima: *See*—
Noguchi, Kosaku; Tanaka, Honami; Kumura, Yukimasa; Yamazaki, Heima; Kitajima, Eiji; and Sunada, Tomonori, 4,640,822, Cl. 422-111.000.
Yamazaki Machinery Works, Ltd.: *See*—
Mizukado, Masayoshi; Morishita, Akio; and Muto, Yoshihiro, 4,640,166, Cl. 83-552.000.
Yamazaki, Mutsuki; and Kaga, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Light sensitive semiconductor device for holding electrical charge therein. 4,641,168, Cl. 357-30.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method and apparatus for forming non-single-crystal layer. 4,640,845, Cl. 427-38.000.
Yamazoe, Hisamitsu: *See*—
Kodama, Katsuhiko; and Yamazoe, Hisamitsu, 4,640,257, Cl. 123-571.000.
Yan, Tsoung Y.: *See*—
Green, Gary J.; McVeigh, Harry A.; Penick, Joe E.; and Yan, Tsoung Y., 4,640,675, Cl. 431-2.000.
Yanagihara, Eiichi: *See*—
Fujii, Hideji; Hayakawa, Takayuki; Sato, Shigeru; and Yanagihara, Eiichi, 4,640,729, Cl. 156-257.000.
Yanai, Junichi: *See*—
Mizunoe, Katsumi; Yanai, Junichi; and Kimoto, Kiyoshi, 4,641,296, Cl. 369-46.000.
Yananton, Patrick. Odorless animal litter unit. 4,640,225, Cl. 119-1.000.
Yanase, Sumio: *See*—
Nagata, Masami; Yanase, Sumio; and Setaka, Yousuke, 4,641,066, Cl. 318-254.000.
Yang, Tai-Her. Packing structure for a hanging fan. 4,640,419, Cl. 206-577.000.
Yang, Tai-Her. Ceiling fan with adjustable blowing scope thru a speed-servo and with driving speed control means. 4,640,668, Cl. 417-354.000.
Yano, Makoto: *See*—
Gion, Hidenori; Kubota, Kenji; Nakamura, Michihiro; and Yano, Makoto, 4,641,249, Cl. 364-496.000.
Yano, Takato: *See*—
Higaya, Toshiaki; Ogura, Masaaki; Yano, Takato; Hashizume, Kiyozo; Ogawa, Toshiyuki; and Seko, Nachio, 4,640,608, Cl. 355-15.000.
Yano, Tsutomu: *See*—
Fukukita, Hiroshi; Tachita, Ryobun; Fukaya, Kuniaki; and Yano, Tsutomu, 4,641,260, Cl. 364-737.000.
Yashiki, Seiji: *See*—
Higashi, Haruki; Yashiki, Seiji; Waki, Kouichirou; and Kikuchi, Toshiyuki, 4,640,394, Cl. 192-3.290.
Yashiro, Hirokatsu: *See*—
Ohno, Jiro; and Yashiro, Hirokatsu, 4,641,036, Cl. 250-574.000.
Ohno, Jiro; and Yashiro, Hirokatsu, 4,641,083, Cl. 324-58.50B.
Yasuda, Kiyoshi: *See*—
Nishino, Kenichi; Kobayashi, Atsuo; Higashi, Sachio; Yamamoto, Shinichiro; and Yasuda, Kiyoshi, 4,640,950, Cl. 524-265.000.
Yasukawa, Masao; and Taguchi, Yukiyasu, to Toyota Jidosha Kabushiki Kaisha. Gear assembly adapted for mating with a third gear without backlash. 4,640,147, Cl. 74-409.000.
Yasumoto, Hitoshi; and Tanimoto, Tetsuyuki, to Minolta Camera Kabushiki Kaisha. Light source for a color enlargement. 4,640,609, Cl. 355-37.000.
Yasumune, Masaru: *See*—
Kawaguchi, Masashi; and Yasumune, Masaru, 4,640,081, Cl. 53-510.000.
Yasunaga Engineering Kabushiki Kaisha: *See*—
Shimizu, Hiroshi, 4,640,259, Cl. 125-16.00R.
Yata, Kiyoshi; and Sawada, Hideo, to Hitachi, Ltd. System for detecting access to storage. 4,641,277, Cl. 364-900.000.
Yeaman, George A.: *See*—
Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., 4,640,676, Cl. 431-54.000.
Yeh, Pochi A.: *See*—
Tracy, John M.; Yeh, Pochi A.; and Khoshnevisan, Mohsen, 4,640,618, Cl. 356-345.000.
Yermal, Michael F.: *See*—
Varga, LeRoy M.; and Yermal, Michael F., 4,640,321, Cl. 140-93.00C.
Yilmaz, Hamza, to General Electric Company. Current limited insulated gate device. 4,641,162, Cl. 357-23.400.
Yokoi, Shinichi; and Ito, Tsuneo, to NGK Spark Plug Co., Ltd. Method for manufacturing a ceramic heater. 4,640,809, Cl. 264-61.000.
Yokota, Hirofumi: *See*—
Meguro, Kenjiro; Sagawa, Koichiro; Yokota, Hirofumi; and Takehara, Masahiro, 4,640,943, Cl. 523-200.000.
Yokota, Massaki, to Tachikawa Spring Co. Ltd. Headrest for a vehicle seat. 4,640,549, Cl. 297-410.000.
Yokota, Yuji; and Osabe, Akira, to Canon Denshi Kabushiki Kaisha. Apparatus for loading a magnetic disc and for controlling the driving thereof. 4,641,212, Cl. 360-99.000.
Yokoyama, Junji: *See*—
Takei, Shinzo; Yokoyama, Junji; and Takagi, Makoto, 4,640,700, Cl. 65-59.220.
Yokoyama, Shotaro; and Nishibe, Takashi, to Fuji Electric Corporate Research and Development, Ltd.; and Fuji Electric Company, Ltd. Image data comparison circuit for rangefinders. 4,640,613, Cl. 356-1.000.
Yokoyama, Takanori: *See*—
Fukunaga, Yasushi; Kuzunuki, Soshiro; Shojima, Hiroshi; Yokoyama, Takanori; Koga, Kazuyoshi; Hirasawa, Kotaro; and Kawada, Shinichi, 4,641,354, Cl. 382-13.000.
Yokoyama, Yasushi: *See*—
Terano, Minoru; Yokoyama, Yasushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,640,906, Cl. 502-104.000.
Yokoyama, Yukio; Kimura, Katsuji; and Goto, Naohisa, to NEC Corporation; and Goto, Naohisa. Portable radio communication apparatus comprising an antenna member for a broad-band signal. 4,641,366, Cl. 455-89.000.
Yoshida, Hiroshi; and Hasegawa, Akira, to Yoshida Kogyo K. K. Slide fastener stringer having continuous thermo-plastic molded coupling element strip. 4,639,981, Cl. 24-401.000.
Yoshida, Ichirou; Atsumi, Morihiro; Nakamura, Naotaka; Yagi, Kenji; Yamaguchi, Shunzo; and Yamada, Manabu, to Nippondenso Co., Ltd. Ignition distributor for internal combustion engines. 4,640,996, Cl. 200-19.00R.
Yoshida Kogyo K. K.: *See*—
Kuse, Kazuki, 4,640,008, Cl. 29-767.000.
Yoshida, Hiroshi; and Hasegawa, Akira, 4,639,981, Cl. 24-401.000.
Yoshida, Naoyuki; Kitano, Kisei; Furukawa, Yoshito; Ogawa, Tetsuya; Sugimori, Shigeru; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, to Chisso Corporation. 1,4-dipyrimidinylbenzene derivative. 4,640,796, Cl. 252-299.610.
Yoshida, Taichi. Power winder attachment for a camera. 4,640,598, Cl. 354-173.100.
Yoshimaru, Tomohisa, to Kabushiki Kaisha Toshiba. Method and apparatus for performing a memory operation on a fixed length block of data on a memory disk. 4,641,294, Cl. 369-32.000.

Yoshimura, Frederick T.: *See*—
Jensen, Tom M.; Yoshimura, Frederick T.; and Jensen, Deborah P., 4,640,525, Cl. 280-642.000.
Yoshioka, Masahiro; and Tsubouchi, Haruyoshi, to Hitachi, Ltd. Turbocharger bearing assembly. 4,640,630, Cl. 384-129.000.
Yoshioka, Tatsuo: *See*—
Konishi, Yozo; Akashi, Kichizo; Watase, Hideo; and Yoshioka, Tatsuo, 4,641,271, Cl. 364-478.000.
Yotsutani, Akio; Makino, Masayuki; Saegusa, Noboru; and Sone, Tomoshi, to NEC Corporation. Mobile radio communication system. 4,640,986, Cl. 379-60.000.
Young, Quentin H., to Southern Steel Company. Door locking system. 4,640,108, Cl. 70-129.000.
Yuto, Kazuaki: *See*—
Takiguchi, Eiji; Yuto, Kazuaki; and Oniki, Toru, 4,640,952, Cl. 524-296.000.
Yuzaki, Yoshinori: *See*—
Oe, Tsutomu; Kimura, Shigeaki; Yuzaki, Yoshinori; and Ozaki, Tadao, 4,640,453, Cl. 228-17.700.
Z-Lock Company, Inc.: *See*—
Derman, Jay S., 4,640,106, Cl. 70-14.000.
Zajic, James E.; and Gerson, Donald F., to Canadian Patents & Development Ltd/Societe Canadienne des Brevets et d'Exploitation Ltd. Hydrocarbon extraction agents and microbiological processes for their production. 4,640,767, Cl. 208-390.000.
Zebedee, Alan R.; and Hutchins, Derek R., to Nouveaux Security Products Limited. Hinge bolt set. 4,640,052, Cl. 49-383.000.
Zecher, Wilfried; Reinking, Klaus; and Kleiner, Frank, to Bayer Aktiengesellschaft. Process for the production of polyamide imides. 4,640,970, Cl. 528-73.000.
Zeitz, Rudiger: *See*—
Greving, Gerhard; Hofgen, Gunther; and Zeitz, Rudiger, 4,641,142, Cl. 342-399.000.
Zelenka, Frank, to Bartell Industries Ltd. Brake system for cutters of surface cleaning cutter cage. 4,640,553, Cl. 299-39.000.
Zellmer, Joel A.: *See*—
Neuder, David L.; and Zellmer, Joel A., 4,641,348, Cl. 382-1.000.
Zenith Electronics Corporation: *See*—
Sutton, Leroy, 4,641,191, Cl. 358-168.000.
Warrick, Julian E., 4,641,189, Cl. 358-154.000.
Ziegler, Gerhard; Gregotsch, Karl; and von Sivers, Rolf, to Dr. Ing.H.c.f. Porsche Aktiengesellschaft. Arrangement for limiting radial thermal expansions of cylinders of a reciprocating piston internal combustion engine. 4,640,240, Cl. 123-193.00C.
Zigman, Donald J. Mobile terminal mounting stand. 4,640,199, Cl. 108-6.000.
Zillig, Robert G.: *See*—
Hoskins, John T.; Zillig, Steven R.; and Caroll, James E., 4,640,534, Cl. 285-158.000.
Zillig, Steven R.: *See*—
Hoskins, John T.; Zillig, Steven R.; and Caroll, James E., 4,640,534, Cl. 285-158.000.
Zillmer, Adalbert: *See*—
Hartkopf, Hans O.; and Zillmer, Adalbert, 4,641,243, Cl. 364-436.000.
Zimmer, Inc.: *See*—
Lower, Jerry L., 4,640,271, Cl. 128-92.0YF.
Zimmermann, Herbert: *See*—
Modic, Fedor; Leibfried, Wolfgang; Nitsch, Manfred; Spitzenberger, Kurt; and Zimmermann, Herbert, 4,640,739, Cl. 156-659.100.
Zine, Anthony R., Jr.: *See*—
Carroll, Richard J.; Luderer, Albert A.; Smith, Ward C.; and Zine, Anthony R., Jr., 4,640,785, Cl. 210-782.000.
Zisholtz, Barry. Mobile for infants. 4,640,034, Cl. 40-455.000.
Zodiac: *See*—
Ferronniere, Michel, 4,640,217, Cl. 114-345.000.
Zoerb, Melvin C., to Boeing Company, The. Aircraft wheel brake control system and method. 4,640,475, Cl. 244-111.000.
Zoltan, Steven I., to Advanced Color Technology Inc. Printing head for ink jet printer. 4,641,155, Cl. 346-140.00R.
Zunker, David W.: *See*—
Vassallo, Donald A.; and Zunker, David W., 4,640,946, Cl. 524-45.000.
Zweifel, Terry L.; and Miller, Harry, to Sperry Corporation. Cruise airspeed control for aircraft. 4,641,268, Cl. 364-440.000.
Zwieg, Grover A.: *See*—
Dola, Frank P.; Siwinski, Paul P.; and Zwieg, Grover A., 4,640,569, Cl. 339-143.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF FEBRUARY, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bigelow-Sanford, Inc.: *See*—
Wind, Joseph H., Re. 32,344, Cl. 206-599.000.

Ciba-Geigy Corp.: *See*—
Neher, Robert; and Riniker, Bernhard, Re. 32,347, Cl. 514-12.000.

Completion Tool Company: *See*—
Wood, Edward T., Re. 32,345, Cl. 277-34.000.

Hilts, Robert L.: *See*—
Vinzant, Michael B.; Speegle, Steven C.; Meaders, Michael W.; and Hilts, Robert L., Re. 32,343, Cl. 166-322.000.

Klamer, Reuben B.; and Mortonson, Robert J., to Trend Products Group. Trainer/learner skate. Re. 32,346, Cl. 280-11.200.

Meaders, Michael W.: *See*—
Vinzant, Michael B.; Speegle, Steven C.; Meaders, Michael W.; and Hilts, Robert L., Re. 32,343, Cl. 166-322.000.

Mortonson, Robert J.: *See*—
Klamer, Reuben B.; and Mortonson, Robert J., Re. 32,346, Cl. 280-11.200.

Neher, Robert; and Riniker, Bernhard, to Ciba-Geigy Corp. Hypocalcaemic peptides and process for their manufacture. Re. 32,347, Cl. 514-12.000.

Otis Engineering Corporation: *See*—
Vinzant, Michael B.; Speegle, Steven C.; Meaders, Michael W.; and Hilts, Robert L., Re. 32,343, Cl. 166-322.000.

Riniker, Bernhard: *See*—
Neher, Robert; and Riniker, Bernhard, Re. 32,347, Cl. 514-12.000.

Speegle, Steven C.: *See*—
Vinzant, Michael B.; Speegle, Steven C.; Meaders, Michael W.; and Hilts, Robert L., Re. 32,343, Cl. 166-322.000.

Trend Products Group: *See*—
Klamer, Reuben B.; and Mortonson, Robert J., Re. 32,346, Cl. 280-11.200.

Vinzant, Michael B.; Speegle, Steven C.; Meaders, Michael W.; and Hilts, Robert L., to Otis Engineering Corporation. Well safety valve. Re. 32,343, Cl. 166-322.000.

Wind, Joseph H., to Bigelow-Sanford, Inc. Shipping pallet and a package formed therefrom. Re. 32,344, Cl. 206-599.000.

Wood, Edward T., to Completion Tool Company. Packer valve arrangement. Re. 32,345, Cl. 277-34.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Campcore Inc.: *See*—
Fitzpatrick, John R., B1 3,820,292, Cl. 52-81.000.

Dichiara, Anthony J. Quick-connect vent tube structure. B1 3,736,966, 2-3-87, Cl. 141-392.000.

Fitzpatrick, John R., to Campcore Inc. Building structure. B1 3,820,292, 2-3-87, Cl. 52-81.000.

Flexible Packaging Research and Consulting: *See*—
Goglio, Luigi, B1 3,799,427, Cl. 383-103.000.

Goglio, Luigi, to Flexible Packaging Research and Consulting. Degassing valve for hermetically sealed flexible containers and a container provided with the valve. B1 3,799,427, 2-3-87, Cl. 383-103.000.

Mullenberg, Ralph. Clamping assembly. B1 3,958,888, 2-3-87, Cl. 403-13.000.

LIST OF DESIGN PATENTEES

A/S More Tekstilfabrikk: *See*—
Gjendemsjo, Peder, 288,043, Cl. D6-603.000.

Abbott Laboratories: *See*—
Larkin, Mark E.; and Tripp, Edward S., 288,130, Cl. D24-56.000.

Abitz, Roger E. Work piece support. 288,099, 2-3-87, Cl. D15-140.000.

Adidas Fabrique de Chaussures de Sport: *See*—
Chassaing, Jacques, 288,028, Cl. D2-320.000.

Ahlemann & Schlatter GmbH: *See*—
Schmidt, Rudiger, 288,133, Cl. D26-28.000.
Schmidt, Rudiger, 288,134, Cl. D26-28.000.

Akens, Gentry L., II; and Ware, H. Joe. Eye for figure toy. 288,107, 2-3-87, Cl. D21-189.000.

Alexander, Frederick D., to Ekco Products, Inc. Roaster. 288,055, 2-3-87, Cl. D7-354.000.

American Commercial, Incorporated: *See*—
Levien, Robin, 288,046, Cl. D7-17.000.

Aronson, David B. Combined greeting card and candy package. 288,062, 2-3-87, Cl. D9-332.000.

Ball, Randell D. Lawn sprinkler locator. 288,058, 2-3-87, Cl. D8-1.000.

Barnes, Anna: *See*—
Hollingshead, John; and Barnes, Anna, 288,105, Cl. D21-167.000.

Barthropp, Francis M. L. Toy gun. 288,104, 2-3-87, Cl. D21-147.000.

Baxter Travenol Laboratories, Inc.: *See*—
White, Leonard A.; and Cabernoch, James L., 288,128, Cl. D24-47.000.

Bek, Helge S.; and Jorgensen, Stig, to Pharmacia AS. Dispensing tube for liquid or paste-like substances. 288,061, 2-3-87, Cl. D9-302.000.

Bennett, Lewis W., to Itek Graphix Corp. Keyboard. 288,095, 2-3-87, Cl. D14-100.000.

Black & Decker, Inc.: *See*—
Somers, Robert I., 288,060, Cl. D8-69.000.
Trelford, Alan; and Cunningham, Laurence T., 288,098, Cl. D15-17.000.

Blanke Plastic Company: *See*—
Taylor, Beverly W., 288,129, Cl. D24-56.000.

Bloom, Stefan A. Outer front face of a utensil knob. 288,056, 2-3-87, Cl. D7-393.000.

Bonnet, Eric, to Jean Lassale S.A. Wrist watch. 288,067, 2-3-87, Cl. D10-39.000.

Boucher, Richard, to Sanitoy, Inc. Bath ring for infants. 288,118, 2-3-87, Cl. D23-69.000.

Boyd Lighting Company: *See*—
Pfister, Murray C., 288,136, Cl. D26-87.000.

BP Electronics, Inc.: *See*—
Towell, Bruce R.; and Rey, Arthur, 288,092, Cl. D14-84.000.

Breeze, Phyllis M.; Wescoat, Jay T.; Wilkinson, Jean; and Grugett, Anita G., to White River Industries, Inc. Receptacle or similar article. 288,042, 2-3-87, Cl. D6-563.000.

Brickus, Romas A.; Tiffany, Thomas O.; and Keramaty, Hamid, to Fisher Scientific Company. Centrifugal analyzer rotor. 288,124, 2-3-87, Cl. D24-31.000.

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Osawa, Toru; and Nishio, Hideaki, 288,077, Cl. D12-142.000.
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Tokyo Juki Industrial Co., Ltd.: *See*—
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Tonkel, Raymond F., to Kangaroos U.S.A., Inc. Flexible sole for athletic shoe. 288,027, 2-3-87, Cl. D2-320.000.
Towell, Bruce R.; and Rey, Arthur, to BP Electronics, Inc. Video selector. 288,092, 2-3-87, Cl. D14-84.000.
Tozaki, Koichi, to Nichimo Kabushiki Kaisha. Otter board. 288,110, 2-3-87, Cl. D22-135.000.
Trelford, Alan; and Cunningham, Laurence T., to Black & Decker Inc. Collector box for lawnmowers, lawnrakers or the like. 288,098, 2-3-87, Cl. D15-17.000.
Tripp, Edward S.: *See*—
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Tsukagoshi, Tetsuhito; Matsunuma, Tamotsu; and Makino, Shigeo, to Bridgestone Corporation. Automobile tire. 288,081, 2-3-87, Cl. D12-147.000.
Tyler, Frank S., to Lever Brothers Company. Packaging container. 288,063, 2-3-87, Cl. D9-425.000.
Tyler, Frank S., to Lever Brothers Company. Packaging container. 288,065, 2-3-87, Cl. D9-429.000.
Unger, Steve A., to Syracuse China Corporation. Food cup. 288,044, 2-3-87, Cl. D7-6.000.
Unger, Steve A., to Syracuse China Corporation. Tea cup or similar article. 288,045, 2-3-87, Cl. D7-9.000.
Unger, Steve A., to Syracuse China Corporation. Soup bowl or similar article. 288,047, 2-3-87, Cl. D7-20.000.
Unger, Steve A., to Syracuse China Corporation. Soup bowl or similar article. 288,048, 2-3-87, Cl. D7-20.000.
Unger, Steve A., to Syracuse China Corporation. Soup bowl or similar article. 288,049, 2-3-87, Cl. D7-20.000.
Unger, Steve A., to Syracuse China Corporation. Soup bowl or similar article. 288,051, 2-3-87, Cl. D7-28.000.
van Berne, Joost; van der Vlies, Gerardus J.; and Howard, John A., to Lever Brothers Company. Combined bucket and dispensing lid. 288,139, 2-3-87, Cl. D32-53.000.
van der Vlies, Gerardus J.: *See*—
van Berne, Joost; van der Vlies, Gerardus J.; and Howard, John A., 288,139, Cl. D32-53.000.
Versalite, Inc.: *See*—
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Victaulic Company of America: *See*—
McLennan, William R.; and Rung, Robert, 288,116, Cl. D23-7.000.
Vogel, Robert M. Christmas tree. 288,074, 2-3-87, Cl. D11-118.000.
Ware, H. Joe: *See*—
Akens, Gentry L., II; and Ware, H. Joe, 288,107, Cl. D21-189.000.
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Watkins, Jonathan, to Watkins Manufacturing Co. Spa. 288,125, 2-3-87, Cl. D24-38.000.
Watkins Manufacturing Co.: *See*—
Watkins, Jonathan, 288,125, Cl. D24-38.000.
Webcor Electronics, Inc.: *See*—
Reichenstein, Kenneth, 288,091, Cl. D14-53.000.
Webster, Joseph P., to Newco Enterprises, Inc. Drip coffeemaker brewing basket. 288,057, 2-3-87, Cl. D7-400.000.
Welsh, Richard E., to Dentsply Research & Development Corp. Dental material dispenser. 288,123, 2-3-87, Cl. D24-10.000.
Wescoat, Jay T.: *See*—
Breeze, Phyllis M.; Wescoat, Jay T.; Wilkinson, Jean; and Grugett, Anita G., 288,042, Cl. D6-563.000.
Westinghouse Electric Corp.: *See*—
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Wheeler, Milford R. Hand statue or similar article. 288,076, 2-3-87, Cl. D11-160.000.
White, Leonard A.; and Cabernoch, James L., to Baxter Travenol Laboratories, Inc. Infant nurser or similar article. 288,128, 2-3-87, Cl. D24-47.000.
White River Industries, Inc.: *See*—
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Wilkinson, Jean: *See*—
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Williams, Woodrow W., to GTE Service Corporation. Telephone line status indicator. 288,070, 2-3-87, Cl. D10-78.000.
Winters, Dorothy. Ring. 288,072, 2-3-87, Cl. D11-33.000.
Wyss, B. O.: *See*—
Laughlin, Jennifer, 288,023, Cl. D2-252.000.
Laughlin, Jennifer, 288,024, Cl. D2-252.000.
Laughlin, Jennifer, 288,025, Cl. D2-252.000.
Laughlin, Jennifer, 288,026, Cl. D2-252.000.
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Laughlin, Jennifer, 288,024, Cl. D2-252.000.
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Laughlin, Jennifer, 288,026, Cl. D2-252.000.

LIST OF PLANT PATENTEES

Chamberlin, Thomas O., Sr., to H.P. Metzler & Sons. Peach tree. 5,873, 2-3-87, Cl. 43.000.

Chrysanthemum Breeders Association N.V.: *See*—
van der Jagt, Martinus, 5,870, Cl. 74.000.
van der Jagt, Martinus, 5,871, Cl. 74.000.

H.P. Metzler & Sons: *See*—
Chamberlin, Thomas O., Sr., 5,873, Cl. 43.000.

Pieper, Wilhelm. *Aechmea fascini* Friederike. 5,872, 2-3-87, Cl. 88.000.

van der Jagt, Martinus, to Chrysanthemum Breeders Association N.V. Chrysanthemum 'White Refla'. 5,870, 2-3-87, Cl. 74.000.

van der Jagt, Martinus, to Chrysanthemum Breeders Association N.V. Chrysanthemum 'Pink Refla'. 5,871, 2-3-87, Cl. 74.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 3RD DAY OF FEBRUARY, 1987

Ashwell, James R.: *See*—
Green, George M.; and Ashwell, James R., H205, Cl. 342-134.000.

AT&T Bell Laboratories: *See*—
Ng, Kwok K.; and Sze, Simon M., H208, Cl. 357-75.000.
Oh, Kye H.; and Yaney, David S., H204, Cl. 156-648.000.

Betts, Robert E.: *See*—
Thomas, William B.; and Betts, Robert E., H203, Cl. 102-374.000.

Blische, Herman J.: *See*—
Silvia, Denis A.; and Blische, Herman J., H207, Cl. 102-275.900.

Bullock, Charles D.: *See*—
Newhall, Donald H.; Juhasz, Arpad A.; Bullock, Charles D.; and Pilcher, James O., II, H206, Cl. 73-4.00R.

Chapin, Donald W.; and Thurston, John F., to United States of America, Navy. Fluidic fuel control for advanced ramjet engines. H221, 2-3-87, Cl. 60-243.000.

Fields, Randy R.: *See*—
Marshall, Albert H.; and Fields, Randy R., H218, Cl. 434-22.000.

Geeter, Eugene, to United States of America, Army. Barrel flexure control system. H202, 2-3-87, Cl. 89-14.050.

Green, George M.; and Ashwell, James R. Wide bandwidth radar having improved signal to clutter response characteristics. H205, 2-3-87, Cl. 342-134.000.

Hales, Walter L.: *See*—
Holder, James D.; and Hales, Walter L., H212, Cl. 356-356.000.

Harris, Paul, to United States of America, Army. Bi-input safe detonator. H210, 2-3-87, Cl. 102-210.000.

Holder, James D.; and Hales, Walter L., to United States of America, Army. Displacement and force measurement by means of optically-generated moire fringes. H212, 2-3-87, Cl. 356-356.000.

Jorczak, John K., to United States of America, Army. Recoil mechanism. H217, 2-3-87, Cl. 89-43.010.

Juhasz, Arpad A.: *See*—
Newhall, Donald H.; Juhasz, Arpad A.; Bullock, Charles D.; and Pilcher, James O., II, H206, Cl. 73-4.00R.

Little, John C. Distillation process for the isolation of 1,1-difluoro(-mono- or dihalo)ethoxybenzeneamines. H214, 2-3-87, Cl. 564-437.000.

Marshall, Albert H.; and Fields, Randy R., to United States of America, Navy. Weapon trainer using IR radiation emitted from target. H218, 2-3-87, Cl. 434-22.000.

Newhall, Donald H.; Juhasz, Arpad A.; Bullock, Charles D.; and Pilcher, James O., II, to United States of America, Army. Dynamic pressure calibrator. H206, 2-3-87, Cl. 73-4.00R.

Ng, Kwok K.; and Sze, Simon M., to AT&T Bell Laboratories. Packaging microminiature devices. H208, 2-3-87, Cl. 357-75.000.

Oakley, David J., to United States of America, Energy. Differential pressure pin discharge apparatus. H209, 2-3-87, Cl. 376-261.000.

Oh, Kye H.; and Yaney, David S., to AT&T Bell Laboratories. Method for implanting the sidewalls of isolation trenches. H204, 2-3-87, Cl. 156-648.000.

Panlaqui, Clayton E., to United States of America, Navy. Disiccant plug for missile launcher. H213, 2-3-87, Cl. 89-1.800.

Piggin, Bruce P. Method for and product of electron emissive layer and multibeam CRT thereby. H216, 2-3-87, Cl. 313-302.000.

Pilcher, James O., II: *See*—
Newhall, Donald H.; Juhasz, Arpad A.; Bullock, Charles D.; and Pilcher, James O., II, H206, Cl. 73-4.00R.

Sayles, David C., to United States of America, Army. Layered construction of composite interceptor motor cases, etc. H219, 2-3-87, Cl. 156-169.000.

Silvia, Denis A.; and Blische, Herman J., to United States of America, Army. Over-under destructive crossover circuit. H207, 2-3-87, Cl. 102-275.900.

Stewart, Paul L., to United States of America, Army. Fuze for riot control grenade. H215, 2-3-87, Cl. 102-487.000.

Sze, Simon M.: *See*—
Ng, Kwok K.; and Sze, Simon M., H208, Cl. 357-75.000.

Thomas, William B.; and Betts, Robert E., to United States of America, Army. Integral rocket motor-warhead. H203, 2-3-87, Cl. 102-374.000.

Thurston, John F.: *See*—
Chapin, Donald W.; and Thurston, John F., H221, Cl. 60-243.000.

United States of America
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Geeter, Eugene, H202, Cl. 89-14.050.
Harris, Paul, H210, Cl. 102-210.000.
Holder, James D.; and Hales, Walter L., H212, Cl. 356-356.000.
Jorczak, John K., H217, Cl. 89-43.010.
Newhall, Donald H.; Juhasz, Arpad A.; Bullock, Charles D.; and Pilcher, James O., II, H206, Cl. 73-4.00R.
Sayles, David C., H219, Cl. 156-169.000.
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Vanderbeck, William E., H211, Cl. 42-17.000.
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Oakley, David J., H209, Cl. 376-261.000.
Navy: *See*—
Chapin, Donald W.; and Thurston, John F., H221, Cl. 60-243.000.
Marshall, Albert H.; and Fields, Randy R., H218, Cl. 434-22.000.
Panlaqui, Clayton E., H213, Cl. 89-1.800.

Vanderbeck, William E., to United States of America, Army. Combined ejector-rammer for small arms. H211, 2-3-87, Cl. 42-17.000.

Vogel, E. Michael, to United States of America, Army. Optical performance comparator. H220, 2-3-87, Cl. 356-124.500.

Yaney, David S.: *See*—
Oh, Kye H.; and Yaney, David S., H204, Cl. 156-648.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 3, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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212 4,640,742

CLASS 164

246 4,640,333
287 4,640,334
440 4,640,335
4,640,336
443 4,640,337
448 4,640,338

CLASS 165

1 4,640,339
41 4,640,340
4,640,341
69 4,640,342
70 4,640,343
86 4,640,344
92 4,640,345
95 4,640,346
104.26 4,640,347
158 4,640,348

CLASS 166

68.5 4,640,349
117.5 4,640,350
127 4,640,351
245 4,640,352
248 4,640,353
250 4,640,354
269 4,640,355
272 4,640,356
273 4,640,357
274 4,640,358
276 4,640,359
286 4,640,360
288 4,640,361
298 4,640,362
317 4,640,363
322 Re.32,343

CLASS 171

16 4,640,364

CLASS 172

26 4,640,365
42 4,640,366
225 4,640,367
430 4,640,368

CLASS 173

42 4,640,369

CLASS 174

23 R 4,640,978
35 GC 4,640,979
36 4,640,980
75 R 4,640,982
88 R 4,640,981
119 R 4,640,983
135 4,640,984
138 F 4,640,985

CLASS 175

4.6 4,640,370
61 4,640,371
208 4,640,372
272 4,640,373
393 4,640,374
410 4,640,375

CLASS 177

50 4,640,376

CLASS 180

9.1 4,640,377
53.1 4,640,378
140 4,640,379
141 4,640,380

CLASS 181

144 4,640,381
175 4,640,382

CLASS 182

38 4,640,383
51 4,640,384
113 4,640,385
155 4,640,386
213 4,640,387
231 4,640,388

CLASS 187

119 4,640,389

CLASS 188

73.37 4,640,390
353 4,640,391

CLASS 190

108 4,640,392

CLASS 192

70.2 4,640,294
0.052 4,640,393
3.29 4,640,394
3.31 4,640,395
18 B 4,640,397
70.18 4,640,398
70.25 4,640,399
4,640,400
85 R 4,640,401
106.2 4,640,402
331 4,640,396

CLASS 193

34 4,640,403
35 TE 4,640,404

CLASS 194

235 4,640,405

CLASS 198

377 4,640,406
389 4,640,407
460 4,640,408
624 4,640,409
803.01 4,640,410

CLASS 200

5 A 4,640,994
11 DA 4,640,995
19 R 4,640,996
61.54 4,640,997
67 A 4,640,998
144 B 4,640,999
148 R 4,641,000
153 G 4,641,001
4,641,002
332 4,641,003
340 4,641,004

CLASS 203

87 4,640,743

CLASS 204

1 R 4,640,744
5 4,640,745
15 4,640,746
37.1 4,640,747
59 R 4,640,748
4,640,749
79 4,640,750
105 R 4,640,751
141.5 4,640,752
181.7 4,640,753
182.4 4,640,754
192.18 4,640,756
192.2 4,640,755
206 4,640,757
272 4,640,758
299 R 4,640,759

CLASS 206

216 4,640,411
232 4,640,413
287 4,640,414
321 4,640,412
387 4,640,415
425 4,640,416
426 4,640,417
499 4,640,418
577 4,640,419
599 Re.32,344

CLASS 208

44 4,640,761
56 4,640,762
78 4,640,763
110 4,640,764
4,640,765
111 4,640,766
390 4,640,760
4,640,767

CLASS 209

37 4,640,768

CLASS 210

96.1 4,640,769
144 4,640,770
167 4,640,771
295 4,640,772
321.1 4,640,773
323.2 4,640,774
387 4,640,775
433.2 4,640,776
4,640,777
484 4,640,778
493.5 4,640,779
512.2 4,640,780
520 4,640,781
748 4,640,782
760 4,640,783
776 4,640,784
782 4,640,785

CLASS 211

4 4,640,420

CLASS 212

175 4,640,421

CLASS 213

155 4,640,422

CLASS 215

10 4,640,423
11 E 4,640,425
11 R 4,640,424
228 4,640,426
232 4,640,427
270 4,640,428
320 4,640,429
330 4,640,430

CLASS 219

10.55 E 4,641,005
10.55 F 4,641,006
69 M 4,641,007
84 4,641,008
200 4,641,009
222 4,641,010
328 4,641,011
331 4,641,012
364 4,641,013
370 4,641,014
386 4,641,015
523 4,641,016

CLASS 220

1 C 4,640,431
75 4,640,432
266 4,640,433
287 4,640,434
307 4,640,435
359 4,640,436
4,640,438
400 4,640,437
445 4,640,439

CLASS 222

190 4,640,440
207 4,640,441
209 4,640,442
321 4,640,443
4,640,444
386.5 4,640,445
416 4,640,446
603 4,640,447
636 4,640,448

CLASS 224

41 4,640,449
331 4,640,450

CLASS 227

76 4,640,451
131 4,640,452

CLASS 228

17.7 4,640,453
161 4,640,454
176 4,640,455

CLASS 229

122 4,640,456

CLASS 235

457 4,641,017
462 4,641,018

CLASS 236

12.11 4,640,457

CLASS 237

17 4,640,458

CLASS 238

122 4,640,459

CLASS 239

2.2 4,640,460
317 4,640,461
383 4,640,462
424 4,640,463

CLASS 241

34 4,640,464
37.5 4,640,465
40 4,640,466
152 R 4,640,467
199.1 4,640,468

CLASS 242

55 4,640,469
84.2 A 4,640,470
84.53 4,640,471
107 4,640,472
197 4,640,473

CLASS 244

31 4,640,474
111 4,640,475
155 R 4,640,476
214 4,640,477

CLASS 248

27.1 4,640,478
56 4,640,479
62 4,640,480
126 4,640,481
168 4,640,482
311.2 4,640,483
407 4,640,484
422 4,640,485
425 4,640,486
571 4,640,487
588 4,640,488

CLASS 249

122 4,640,489
214 4,640,490
219 W 4,640,491

CLASS 250

201 4,641,019
4,641,020
202 4,641,021
204 4,641,022
216 4,641,023
223 R 4,641,024
227 4,641,025
229 4,641,026
237 G 4,641,027
266 4,641,028
288 4,641,029
308 4,641,030
390 4,641,037
423 R 4,641,031
459.1 4,641,032
492.1 4,641,033
492.2 4,641,034
548 4,641,035
574 4,641,036
578 4,641,038

CLASS 251

163 4,640,492
342 4,640,493
354 4,640,494

CLASS 252

8.551 4,640,786
51.5 A 4,640,787
51.5 R 4,640,788
61 4,640,789
62.54 4,640,790
75 4,640,791
78.3 4,640,792
82 4,640,793
194 4,640,794
299.5 4,640,795
299.61 4,640,796
301.36 4,640,797

CLASS 254

8 B 4,640,495
415 4,640,496

CLASS 260

396 N 4,640,800
407 4,640,801
410.9 R 4,640,802

CLASS 261

64.3 4,640,803
81 4,640,804

CLASS 264

1.1 4,640,805
9 4,640,806
13 4,640,807
46.5 4,640,808
61 4,640,809
518 4,640,810

CLASS 266

227 4,640,497
272 4,640,498

CLASS 267

160 4,640,499
168 4,640,500

CLASS 269

21 4,640,501

CLASS 271

4 4,640,502
103 4,640,503
113 4,640,504
209 4,640,505
212 4,640,506
245 4,640,507

CLASS 272

128 4,640,508

CLASS 273

1 GF 4,640,509
1 R 4,640,510
49 4,640,511
157 R 4,640,512
249 4,640,513
310 4,640,514
339 4,640,515

CLASS 277

34 Re.32,345
236 4,640,516

CLASS 279

2 R 4,640,517
123 4,640,518

CLASS 280

11.2 Re.32,346
42 4,640,519
47.31 4,640,520
47.34 4,640,521
460 A 4,640,522
491 D 4,640,523
611 4,640,524
642 4,640,525
707 4,640,526
781 4,640,527
789 4,640,528

CLASS 281

5 4,640,529

CLASS 285

18 4,640,530
24 4,640,531
41 4,640,532
62 4,640,533
158 4,640,534
4,640,535
367 4,640,536
368 4,640,537

CLASS 290

44 4,641,039
52 4,641,040

CLASS 292

323 4,640,538

CLASS 294

19.1 4,640,539
55 4,640,540

CLASS 296

1 S 4,640,541
37.8 4,640,542
97 K 4,640,543
181 4,640,544

CLASS 297

216 4,640,545
260 4,640,546
301 4,640,547
320 4,640,548
410 4,640,549
483 4,640,550

CLASS 299

1 4,640,551
24 4,640,552
39 4,640,553

CLASS 303

6 C 4,640,554
10 4,640,555
22 R 4,640,556
100 4,640,557
119 4,640,558

CLASS 305

11 4,640,559

CLASS 307

10 R 4,641,041
66 4,641,042
117 4,641,043
269 4,641,044
350 4,641,045
448 4,641,046
454 4,641,047
590 4,641,049
591 4,641,048

CLASS 310

27 4,641,050
61 4,641,051
317 4,641,052
4,641,053
324 4,641,054
368 4,641,055

CLASS 312

234.1 4,640,560

CLASS 313

51 4,641,056
62 4,641,057
449 4,641,058
477 R 4,641,059

CLASS 315

111.71 4,641,060
210 4,641,061
368 4,641,062
383 4,641,063
411 4,641,064

CLASS 318

135 4,641,065
254 4,641,066
287 4,641,067
317 4,641,068
625 4,641,069
640 4,641,070
4,641,071
687 4,641,072
696 4,641,073
706 4,641,074
811 4,641,075

CLASS 320

2 4,641,076
4,641,077
21 4,641,078
64 4,641,079

CLASS 322

49 4,641,080

CLASS 323

313 4,641,081

CLASS 324

58 B 4,641,082
58.5 B 4,641,083
71.5 4,641,084
77 R 4,641,085
4,641,086
83 R 4,641,087
86 4,641,088
103 P 4,641,089
107 4,641,090
202 4,641,091
227 4,641,092
239 4,641,093
302 4,641,094
309 4,641,095
311 4,641,096
318 4,641,097
322 4,641,098
323 4,641,099
330 4,641,100

CLASS 328

25 4,641,101
62 4,641,102
228 4,641,103
234 4,641,104

CLASS 330

9 4,641,105
286 4,641,106
4,641,107
307 4,641,108

CLASS 331

116 FE 4,641,109

CLASS 333

12 4,641,110
115 4,641,111
140 4,641,112
161 4,641,113
4,641,114

181 4,641,115
204 4,641,116

CLASS 335

7 4,641,117
282 4,641,118
297 4,641,119

CLASS 336

342 4,640,623

CLASS 337

242 4,641,120
380 4,641,121

CLASS 338

33 4,641,122
128 4,641,123

CLASS 339

17 F 4,640,561
4,640,562
32 M 4,640,563
40 4,640,564
45 M 4,640,565
91 R 4,640,566
94 M 4,640,567
103 R 4,640,568
143 R 4,640,569
182 R 4,640,570
242 4,640,571
252 R 4,640,572

CLASS 340

64 4,641,124
309.15 4,641,125
310 A 4,641,126
347 AD 4,641,129
4,641,130
347 DA 4,641,131
347 DD 4,641,128
540 4,641,132
4,641,133
567 4,641,134
784 4,641,135
903 4,641,136

CLASS 342

52 4,641,137
61 4,641,138
124 4,641,139
371 4,641,140
379 4,641,141
399 4,641,142
445 4,641,143

CLASS 343

754 4,641,144
798 4,641,145
814 4,641,146

CLASS 346

76 PH 4,641,147
4,641,148
4,641,149
4,641,150
4,641,151
137 4,641,152
140 R 4,641,153
4,641,154
4,641,155
160 4,641,156
4,641,157
4,641,158
200 4,641,159
220 4,641,160

CLASS 350

6.1 4,640,573
96.11 4,640,574
96.20 4,640,575
96.23 4,640,576
96.25 4,640,577
96.32 4,640,592
239 4,640,578
255 4,640,579
274 4,640,580
331 R 4,640,581
333 4,640,582
343 4,640,583
344 4,640,584
413 4,640,585
414 4,640,586
432 4,640,587
516 4,640,588
523 4,640,589
632 4,640,590
4,640,591

CLASS 351

160 R 4,640,594
4,640,595
169 4,640,593
211 4,640,596

CLASS 353

79 4,640,597

CLASS 354

173.1 4,640,598

CLASS 355

3 CH 4,640,599
3 FU 4,640,600
3 R 4,640,601
4,640,603
4,640,604
3 SH 4,640,602
4 4,640,605
14 R 4,640,607
14 TR 4,640,606
15 4,640,608
37 4,640,609
73 4,640,610
77 4,640,611
87 4,640,612

CLASS 356

1 4,640,613
36 4,640,614
130 4,640,615
136 4,640,616
326 4,640,617
345 4,640,618
372 4,640,619
376 4,640,620
434 4,640,621

CLASS 357

22 4,641,161
23.4 4,641,162
4,641,163
4,641,164
23.6 4,641,165
4,641,166
30 4,641,167
4,641,168
4,641,169
35 4,641,170
39 4,641,175
46 4,641,171
48 4,641,172
51 4,641,173
58 4,641,174
74 4,641,176

CLASS 358

3 4,641,177
4,641,178
12 4,641,179
31 4,641,180
36 4,641,181
41 4,641,182
44 4,641,183
75 4,641,184
4,641,185
105 4,641,186
106 4,641,187
140 4,641,188
154 4,641,189
165 4,641,190
168 4,641,191
206 4,641,192
233 4,641,193
242 4,641,194
4,641,195
246 4,641,196
280 4,641,197
285 4,641,198
4,641,199
296 4,641,200
310 4,641,201
313 4,641,202
335 4,641,203
341 4,641,204

CLASS 360

33.1 4,641,205
4,641,206
35.1 4,641,215
55 4,641,207
72.2 4,641,208
86 4,641,209
96.5 4,641,210
97 4,641,211
99 4,641,212
125 4,641,213
130.24 4,641,214

CLASS 361

45 4,641,216
4,641,217
119 4,641,218
153 4,641,219
187 4,641,220
321 4,641,221
403 4,641,222
424 4,641,223
4,641,224
429 4,641,225

CLASS 362

218 4,641,226
231 4,641,227
382 4,641,228

CLASS 363

21 4,641,229
56 4,641,230
58 4,641,231
71 4,641,232
89 4,641,233
124 4,641,234

CLASS 364

149 4,641,235
153 4,641,265
171 4,641,236
200 4,641,237
4,641,238
4,641,266
408 4,641,239
409 4,641,240
4,641,241
414 4,641,242
4,641,267
436 4,641,243
440 4,641,268
473 4,641,269
475 4,641,244
476 4,641,270
478 4,641,245
4,641,271
487 4,641,246
490 4,641,247
492 4,641,248
496 4,641,249
507 4,641,250
513 4,641,251
518 4,641,252
4,641,253
522 4,641,255
525 4,641,256
559 4,641,257
4,641,272
4,641,254
580 4,641,258
710 4,641,259
724 4,641,260
737 4,641,273
822 4,641,261
900 4,641,262
4,641,263
4,641,264
4,641,274
4,641,275
4,641,276
4,641,277

CLASS 365

78 4,641,278
149 4,641,279
183 4,641,280
189 4,641,281
4,641,282
190 4,641,283
210 4,641,284
4,641,285
230 4,641,286

CLASS 366

76 4,640,622

CLASS 367

19 4,641,287
20 4,641,288
85 4,641,289
106 4,641,290
157 4,641,291
198 4,641,292

CLASS 368

111 4,640,624
280 4,640,625

CLASS 369

6 4,641,293
32 4,641,294
4,641,295
4,641,296
75.2 4,641,297
77.1 4,641,298

CLASS 370

15 4,641,299
16 4,641,300
58 4,641,301
60 4,641,302
4,641,307
84 4,641,303
95 4,641,304

CLASS 371

12 4,641,305
16 4,641,308
25 4,641,306
31 4,641,309
38 4,641,310

CLASS 372

18 4,641,311
25 4,641,312
56 4,641,313
65 4,641,314
72 4,641,315
74 4,641,316

CLASS 373

84 4,641,319
96 4,641,320
120 4,641,321

CLASS 374

57 4,640,626
121 4,640,627
141 4,640,628
178 4,640,629

CLASS 375

1 4,641,317
4,641,322
38 4,641,318
76 4,641,324
80 4,641,323
97 4,641,325
108 4,641,326
114 4,641,327

CLASS 376

228 4,640,811
245 4,640,812
327 4,640,813

CLASS 378

8 4,641,328
79 4,641,329
101 4,641,330
108 4,641,331
125 4,641,332
144 4,641,333
4,641,334
153 4,641,335
156 4,641,336

CLASS 379

40 4,641,127
60 4,640,986
62 4,640,987
77 4,640,990
88 4,640,991
89 4,640,992
90 4,640,988
94 4,640,989
162 4,641,337
328 4,641,338
383 4,640,993
391 4,641,339

CLASS 380

3 4,641,346
4,641,347

CLASS 381

15 4,641,341
41 4,641,342
48 4,641,343
57 4,641,344
86 4,641,345
103 4,641,361
111 4,641,377

CLASS 382

1 4,641,348
2 4,641,349
4 4,641,350
6 4,641,351
4,641,352
8 4,641,353
13 4,641,354
34 4,641,355
49 4,641,356
61 4,641,357
68 4,641,358
4,641,359

CLASS 383

15 4,641,360
103 B1 3,799,427
115 4,641,362

CLASS 384

129 4,640,630
297 4,640,631
537 4,640,632

CLASS 400

124 4,640,633
144.2 4,640,634
664 4,640,635

CLASS 401

96 4,640,636
101 4,640,637
145 4,640,638

CLASS 403

13 B1 3,958,888
24 4,640,639
57 4,640,640
150 4,640,641
157 4,640,642

CLASS 404

4 4,640,643
75 4,640,644

CLASS 405

63 4,640,645
141 4,640,646
224 4,640,647
229 4,640,648
237 4,640,649
290 4,640,650

CLASS 409

132 4,640,651
136 4,640,652
233 4,640,653

CLASS 411

55 4,640,654

CLASS 414

119 4,640,655
303 4,640,656
347 4,640,657
462 4,640,658
503 4,640,659
563 4,640,660
619 4,640,661
642 4,640,662
730 4,640,663

CLASS 415

1 4,640,664
4,640,665
121 B 4,640,666

CLASS 417

52 4,640,667
354 4,640,668
410 4,640,669

CLASS 419

8 4,640,814
4,640,815
24 4,640,816

CLASS 420

50 4,640,817

CLASS 422

15 4,640,818
22 4,640,819
68 4,640,820
81 4,640,821
111 4,640,822

CLASS 423

68 4,640,823
185 4,640,824
235 4,640,825
263 4,640,826
279 4,640,827
321 R 4,640,828
328 4,640,829
346 4,640,830
399 4,640,248
481 4,640,831
562 4,640,832

CLASS 424

5 4,640,833
94 4,640,834
4,640,835
195.1 4,640,836

CLASS 425

142 4,640,670
149 4,640,671
192 R 4,640,672
297 4,640,673

CLASS 426

94 4,640,837
107 4,640,838
285 4,640,839
399 4,640,840
425 4,640,841
534 4,640,842
560 4,640,843

CLASS 427

38 4,640,844
4,640,845
54.1 4,640,849
82 4,640,846
150 4,640,847
426 4,640,848

CLASS 428

15 4,640,850
17 4,640,851
35 4,640,852
4,640,853
4,640,854
36 4,640,855
4,640,856
57 4,640,857
90 4,640,858
105 4,640,859
143 4,640,860
294 4,640,861
308.4 4,640,862
323 4,640,863
334 4,640,864
421 4,640,865
422 4,640,866
432 4,640,867
446 4,640,868
469 4,640,869
483 4,640,870
611 4,640,871
659 4,640,872

CLASS 429

24 4,640,873
27 4,640,874
30 4,640,875
37 4,640,876

CLASS 430

14 4,640,877
15 4,640,878
96 4,640,879
106.6 4,640,880
4,640,881
110 4,640,882
122 4,640,883
165 4,640,884
197 4,640,885
271 4,640,886
275 4,640,887
323 4,640,888
504 4,640,890
505 4,640,889
551 4,640,891
617 4,640,892

CLASS 431

1 4,640,674
2 4,640,675
54 4,640,676
75 4,640,678
89 4,640,677
146 4,640,679
350 4,640,680

CLASS 432

14 4,640,681
58 4,640,682
134 4,640,683

CLASS 433

110 4,640,684
141 4,640,685

CLASS 434

262 4,640,686

CLASS 435

23 4,640,893
100 4,640,894
296 4,640,895

CLASS 436

34 4,640,896
501 4,640,897
546 4,640,898

CLASS 455

4 4,641,363
32 4,641,364
78 4,641,365
89 4,641,366
161 4,641,367
239 4,641,368
327 4,641,369
348 4,641,370
601 4,641,371
4,641,372
4,641,373
603 4,641,374
607 4,641,375
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101 4,640,687

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5 4,640,899
67 4,640,900
81 4,640,901
97 4,640,902
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115 4,640,907
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29	4,640,910
42	4,640,911
54	4,640,912
77	4,640,913
210	4,640,915
222	4,640,916
	4,640,917
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241	4,640,919
248	4,640,920
252	4,640,921
256	4,640,922
272	4,640,923
291	4,640,924
331	4,640,925
333	4,640,926
342	4,640,927
422	4,640,928
431	4,640,930
436	4,640,929
510	4,640,931
714	4,640,932

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94	4,640,933
103	4,640,934
137	4,640,935

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14	4,640,936
31	4,640,937
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99	4,640,939
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107	4,640,941
130	4,640,942
200	4,640,943
205	4,640,944
336	4,640,945

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45	4,640,946
109	4,640,947
157	4,640,948
227	4,640,949
265	4,640,950
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779	4,640,956

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316	4,640,959
388	4,640,960
444	4,640,961
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134	4,640,964
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249	4,640,966

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73	4,640,969
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129	4,640,971
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211	4,640,974
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	252	288,023
		288,024
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		288,026
	320	288,027
		288,028
	602	288,029
	642	288,030
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	36	288,032
	71	288,033
D4—	120	288,034
D6—	324	288,035
	333	288,036
	335	288,037
	458	288,038
	468	288,039
	473	288,040
		288,041
	563	288,042
	603	288,043
D7—	6	288,044
	9	288,045
	17	288,046
	20	288,047
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		288,049
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	43	288,052
	58	288,053
	70	288,054
	354	288,055
	393	288,056
	400	288,057
D8—	1	288,058
	34	288,059
	69	288,060
D9—	302	288,061
	332	288,062
	425	288,063
	429	288,065
	436	288,064
D10—	32	288,066
	39	288,067
	50	288,068
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	78	288,070
	92	288,071
D11—	33	288,072
	118	288,073
		288,074
	160	288,075
		288,076
D12—	142	288,077
	146	288,078
		288,079
		288,080
	147	288,081
		288,082
	148	288,083
	151	288,084
	163	288,085
	209	288,086
	315	288,087
	317	288,088
D13—	3	288,089
D14—	33	288,090
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	84	288,092
	94	288,093
	100	288,094
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D15—	17	288,098
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	147	288,104
	167	288,105
	185	288,106
	189	288,107
	198	288,108
	226	288,109
D22—	135	288,110
	142	288,111
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	131	288,120
	139	288,121
D24—	5	288,122
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PATENTS

01 : 4,640,153
4,640,641
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DESIGN PATENTS

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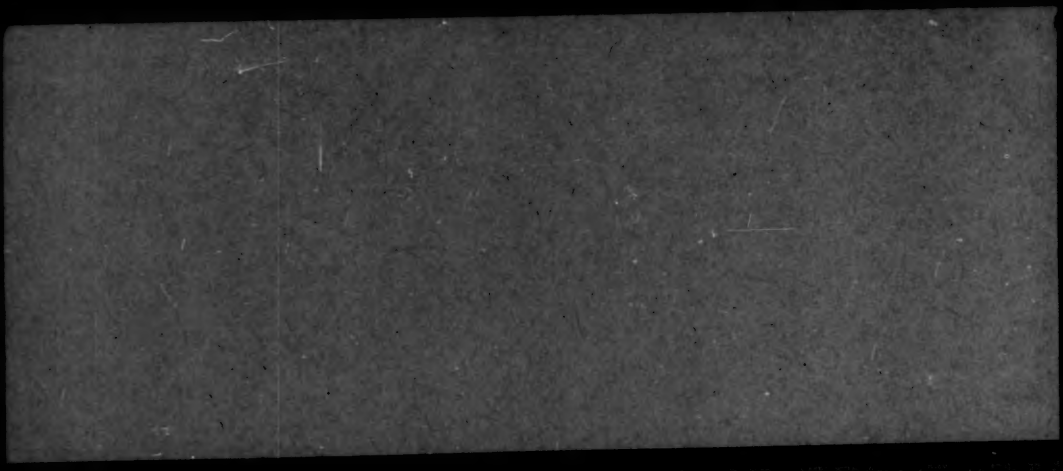
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